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LUNI-SOLAR AND HORARY TABLES,

WITH THEIR APPLICATION IN

NAUTICAL ASTRONOM

CONTAINING

AN EASY AND CORRECT METHOD

OF FINDING

THE LONGITUDE,

BY LUNAR OBSERVATIONS AND CHRONOMETE

THE LATITUDE,

BY DOUBLE ALTITUDES AND ELAPSED TIME, THE AZIMUTH,
AMPLITUDE, AND TRUE TIME,

ACCORDING TO THE SPHEROIDICAL FIGURE OF THE EA

BY

JANET TAYLOR.

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TO THE

KING'S MOST EXCELLENT MAJESTY.

SIRE,

With much anxiety I launch this Volume into criticising world, and would claim for it your Majesty's support an protection, hoping that the practical knowledge you possess of science it may tend to benefit, and your feelings of interest in th class of your subjects, who form the strongest bulwark to yo dominions, may elicit some portion of Your Majesty's attention its humble merits, and ensure it a kindly reception at the han of those who may be inclined to condemn unheard, the humb efforts of one, whose sex would seem hitherto to have been effectual barrier against the pursuit of the more abstruse branch of literature.

Whatever be the merit of the present Work, the talent fro which it has sprung was fostered by the benevolence, and und the immediate patronage of your Illustrious and Revered Mothe therefore, with feelings of the deepest gratitude and respect, I n presume to Dedicate to your Majesty, the following pages; a subscribe myself,

Your Majesty's
Most Humble,
Most Devoted,
And Faithful Subject,
JANET TAYLO

6, East Street,
Red Lion Square.

PREFACE.

WHEN a new writer obtrudes himself upon the Public in capacity of Reformer of long-established usages—and this too i department the most important of all the sciences, whether we re the deep calculations it involves, or the momentous interests wl endear it to the public—something like an apology may be dee requisite on his part to qualify an undertaking, which may other seem presumptuous.

If then, this be applicable in the case of the strongest of the stro sex, how much more indispensable is it that a female—with all disadvantages of a confined school, and the prejudices additior which attach to any efforts that would seem to court publicity in way of literary innovation—should bespeak indulgence at the hanc a criticising world, for the bold but well-meant intention, which prompted the following attempt.

It may be asked perhaps, why volunteer my zeal at all in detect Lynceus like, errors in a system which is known to "work well," which has received the sanction of the constituted authorities? reply is, that if it has "worked well" *in spite* of those errors, it is more likely to work better when released from their operation; an this were my humble efforts most studiously applied, regardless of obloquy which some may choose to lavish upon the rashness of design, and looking for my reward in the profitable results alone, wl may accrue to the community, from the successful prosecution l after, at the hands of a more experienced head-piece, of the abst investigation which I shall at least have originated. Or, if I s have failed in this issue of my fondly cherished hopes, why, the me seek shelter in the conscious disinterestedness of the views w propelled my speculation. It is no part of my wish to villify or duce the laudable exertions of those who have preceded me on this head; they did as much as the lights of their day, no doubt had warranted. I shall content myself therefore with observing, that this publication aspires to supersede the beaten track of former Authors in this subject, else it should never have been embarked in; for, surely when our shelves groan with such a cargo of accumulated books, it would be an offence unpardonable, to think of adding to the number, without at least the redeeming supposition of increasing the stock of knowledge also.

In the first place, I have endeavoured to prove the difference between the Zenith in the perfect and the oblate sphere, for which purpose I have given a clear diagram to shew, that all Altitudes are short of the truth, by the difference existing between the two Zeniths; and, consequently, that all Latitudes found by such Meridian Altitudes, must be too great or too little, and likewise, that the Latitudes in the Charts and Tables of the present day are not geocentric; for, although all our modern writers on the subject have criticised their predecessors, they have omitted making any useful or real improvement, by shewing the difference arising from the figure of the Earth.

Again, when the object is off the Meridian, and has an inclination to the parallel of the place of observation, the difference of the Zenith distance is vanishing. As the object approaches 90° of an Azimuth from the Meridian, it forms a perfect sphere with the Observer; and when it bears from 90° to 180° of an Azimuth, the error increases. See Table XXXI. This I hope is satisfactorily demonstrated in page 6, where more particularly will be seen the error to which I have before alluded.

The Dip of the Horizon, the Refraction and Parallax, I have endeavoured to simplify. The variation of the latter, when the Moon is used, I have given to every degree of Latitude or account of the oblate figure of the Earth It may be used in Lunar Observations, and several other nautical computations. I have compared the usual system of finding the Latitude and Elapsed Time by Double Altitudes, with the method here introduced; and I feel assured, that on an impartial investigation, many will be surprised that such perceptible errors have so long remainedunexplained, and uncommented on. (See page 15.)

Although great accuracy in the true Azimuth is not essential, it
be found corrected to the greatest exactness in page 24, with a con
view of the error of former systems, and the nature and constructio
the one here introduced.

In “the true time,” on which so much depends, and which I h
given with constructions, will be seen the necessity there exists
finding it correctly; and likewise, that those who contend that the
figure of the Earth will make no difference in our calculations, ar
great error; for it is well known, that the Longitude by Lunar Ob
vation depends on the difference between any two meridians, and
1″ of error in the time, will put the best Lunarian a quarter of a
out of his true Longitude, therefore, the greatest accuracy ought t
used in finding the true time at Ship. (See the True Time.)

Mariners frequently, for want of a sufficient number of observer
take Lunar Observations, find the Altitude of one of the object
calculation, and from thence obtain the Apparent Altitude. The
thod, formerly used by all our writers on Navigation, even by the
I have proved to be decidedly in error; for in several cases, it wo
be impossible to clear a Lunar distance, according to the system t
have laid down. A reference to Problem, page 36, will prove
easily this may be avoided.

I have endeavoured to simplify all the rules and calculations
constructions suited to the most common understanding, and h
laid down a General Rule for the solution of most cases in Naut
Astronomy, avoiding all intricacies, and such problems, as I h
noticed in different works, tend more to puzzle than instruct the Pu
The constructions of some of the Problems, requiring a knowledg
Spherical Geometry, I thought best to omit, as they relate chiefl
another branch of the science, and have substituted those which
more simple, but which will be sufficient explanation to the Mari
or Pupil. Most of the former solutions of the important Lu
Problem, are grounded on approximated method, on the fluxion
an arch of a great circle. The plan I have introduced in this w
will be found Mathematically exact and concise, as will be seen f
page 37 to 41. On perusing the following pages, it will be observ
that some of the methods alluded to, admit of a solution to an
possible proposition. (See page 40.) Therefore, I would warn M

ners whose lives and property rest in the track of a Mathematical pen, to observe carefully, whether the method acts for itself or not.

The General Tables are carefully corrected and compared with Taylor's. Several others are likewise introduced, which make the work concise and useful; but it will be better seen in their application than can be explained here.

The Luni-solar Table has been carefully calculated under my direction, and is the result of $\frac{2 \cos h \cos H}{\cos h' \cos H'}$, see the formula in page 38, which renders the Lunars so easy and complete, that the meanest capacity would find no difficulty in clearing a Lunar Distance to the nearest second of the truth, in less than two minutes; and though six places are given, five only are sufficient in any Nautical calculation.

Being obliged to hurry the publication of my Work, for the use of some friends, I am under the necessity of omitting several Exercises in the Practical Problems, and likewise in the Use of the Tables, both of which will be further illustrated in the next Edition.

Some errors may have crept into the calculations, from the multiplicity of entries, &c., these, I trust, will claim the indulgence of the public; for the system on which I have worked being mathematically correct, and founded on sound principles, any slight oversight in the figures can be of but little moment, and very easily rectified.

JULY, 1833,
6, East Street, Red Lion Square.

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Depression of the Horizon
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ERRATA.

In page 5, for Table 12, read 11.
In page 5, for g. b. d.—read g. d. b.
Page 6, for, the difference between the Altitudes and the distance sailed, &c.—read, with the difference of Altitudes and distance sailed, the distance a vessel is from shore may be found.
Page 9, for Table 8,—read Table 24.
Page 10, for Table 19,—read Table 20.
Page 10, for Table 23,—read Table 18.
Page 10, for Table 24,—read Table 13.
Page 10, for Table 25,—read Table 22.
Page 10, for Table 9,—read Table 29.
Page 11, for Table 25,—read Table 29.
Page 11, for Table 25,—read Table 23.
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In Note, page 12, for Table 27,—read Table 28.
In Note, page 18, for Zenith,—read truth.
Page 23, in the formula for +,—read ×.
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Page 41, for Table 34,—read Table 28.
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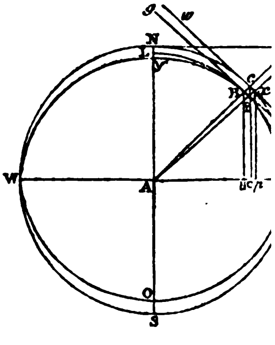
Page 46, for 115 . 5,—read 115 . 0.
In use of Tables, pages 54 and 55, for Table 22,—read 23; and for Table 23,—read 22.

NAUTICAL ASTRONOMY.

PREVIOUS to commencing this part of Navigation, it would advisable to direct our attention to the magnitude and form of Earth.

According to the mensuration of several eminent Mathematicians Navigators who have circumnavigated the Globe, it has been four be an oblate spheroid; consequently the axis is shorter by abou miles than the Equatorial diameter, the Earth being flattened at Poles and distended towards the Equator; which form is suppos be caused by the attraction of the Planets within the Tropics, an daily rotation from West to East. The velocity with which this motion is performed, would force the waters towards the opposite in the Heavens, were it not for the superior power of gravity, w retains them in an equilibrium. That the Globe is an oblate sph was experimentally proved by Sir Isaac Newton, who, by runni spindle through a ball of soft clay, and turning it round quickly, f that it swelled towards the centre and contracted at the poles: the p of attraction, likewise, which the Sun, Moon, and Planets have the waters, tends to raise them higher in that part of the Globe w their influence predominates. Though this theory has long acknowledged, it is surprising that no satisfactory improvements yet been made in those Tables, which are now before the Publ their imperfect state; a careful investigation of the following Diag will, I hope, prove the necessity there is for a correction of then

DIAGRAM.



Let the figure WLEO represent the figure of the Earth, NL or OS=17 miles, and let the Altitude of a Star be 45°=<*c*AE,*= to his declination. The arc *e*E being the celestial arc of the Star, and admitting 45° to be the declination of the Star, then the Latitude of the place would be 45°= arc *c*E, but B*c* being the portion of the Earth answering to this Latitude, is less than that found by the Star by the difference between the arc *c*E, and the elipsis BE; for the elipsis *y*BE is not parallel to

---

* The immense distance of a Star when compared to the Earth's semidiamete bear no proportion to it worth notice, therefore the Altitude of a Star taken fr centre of the Earth, is the same as that from the surface. The refraction being c to both Altitudes reduced by the difference of both horizons=>CAm, or wug.

the sphere N*xc*, therefore the right line AC does not cut off similar segments. Then let *x*E be=half the elipsis LBE, then, with the radius of the Latitude 45°=AR, describe the circle BL, which is parallel to the circle N*x*E, and then HB will be the sine of the arch *x*E, answering to the elipsis B*c*, or the Latitude 45°; therefore the sines, co. sines, &c. &c. which are given in the common artificial sines, tangents and secants, ought not to be made use of in any instance for the Latitudes of places, without reducing them to accord with the above figure—for the sine of the arc *c*E=(declination) is greater than the sine *x*E=by the difference between *cc* and *xp*, for the circle BL is parallel to the circle *x*E, therefore *xp* may be considered the sine of the arc answering to the elipsis of the Latitude. The above diagram will shew the corrections or quantities requisite in the sines, tangents, and secants, in order to make them agree with the true arch of any geocentric Latitude, or with the celestial Latitude found by observation. Had the Globe been a perfect sphere, the true Latitude of any place would have been equal to that found by observation, but on account of the Earth's being an oblate sphere, we find that former observations would never ascertain the geocentric Latitude.

The elipsis is always shorter than its opposite sphere, for a circle described from the centre of the Earth, equal in radius to the Earth's, would pass over head either North or South, and the greater your Latitude, the higher would that circle be. Therefore, supposing the point of that meridian circle over your head, could be brought to your feet, it would extend to the North or South of you. Were you at the Pole, it is evident that if the Circle N*x*E were compared with L*c*E, it would be found much longer. A knowledge of this enables us to find the breadth of any degree of Latitude, without the trouble of traversing the Globe for the purpose of making observations, as many of our Navigators and Astronomers have done, otherwise the contemplations of Sir Isaac Newton, in his library, where he made his calculations, would have but little benefited that science to which his sublime genius was devoted, and into whose interminable recesses it dived to an extent before unknown.

Mr. Norwood, in measuring the breadth of a degree on the Meridian from London to York, used the following method. Take the Altitude of any known heavenly body, at any two places of the same Meridian, whose distance asunder may be correctly ascertained or measured; then find the difference between their zenith distances, and say, as the difference of the zenith distances is to the distance or difference of Latitude on a plain between these two places, so is 60° to the breadth of a degree on the Meridian of that place.

That is, as the breadth of a celestial arch is to the breadth of its opposite terrestrial arch, so is 60′ of a celestial arch to the breadth of a degree on the Earth.

In 1756, the French in measuring the breadth of a degree on the Earth, used the same method.

That the surface of the Earth is not a perfect sphere is now universally acknowledged; consequently it cannot be parallel to the celestial arch, therefore, (by 2nd, 12th of Euclid,) the celestial arch bears no correct proportion to the terrestrial arch; and, from hence, we may very naturally conclude, that those who have measured a breadth of a degree of a great circle on the Meridian of the Earth, by the above method of proportions, have been misled, and, of course, their observations on this subject must be erroneous.

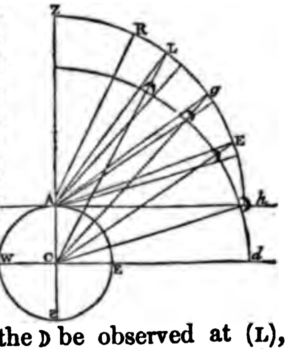
When the Sun is on the Meridian, the difference between the geocentric or spheroidical and the true horizon, will be observed to be increasing from the Equator to Latitude 45°, and decreasing from thence to the poles, and when the Sun is off the Meridian, the difference will be decreasing until the object is 90° from the Meridian, when it will be on the same great circle or parallel with the observer. When the Azimuth is more than 90° it is vice versa; in such cases the geocentric altitudes will be greater than the perfect spheroidical altitude, which difference is laid down and calculated in Table 31.

THE PARALLAX

OF THE

HEAVENLY BODIES.

PARALLAX is the difference between an Altitude taken from the surface of the Earth, and that taken from the centre at the same time, and is demonstrated in the following figure.



Let the circle AESW represent the Earth, and let an observer be at A, his horizon A*h*. Let the Moon be observed on the horizon at ☽ *h*, her Altitude 0° 0′ 0″, then her Altitude from the centre of the earth will be = < *h*C*d* = < A*h*C = her horizontal Parallax. Again, let the Moon be at E, her Altitude above the horizon (A*h*) is = < EA*h*, and at the same time, from the centre of the Earth, it will be = < ☽ C*d*, which is greater than the < EA*h*, by the < AEC, which is the Parallax of that Altitude. Therefore the < AEC + < EA*h* = ☽ C*d* = (to her true Altitude). Again, let the ☽ be observed at (L), then her Altitude above the horizon A*h*, is = (< LA*h*), and from the centre, = < ☽ C*d*, which is greater than the angle (LA*h*), by the angle (ALC), which is the parallax in that Altitude, therefore the < ALC + < LA*h* = ☽C*d*, or true Altitude.

It is evident that the circle ☽ ☽ ☽ *d*, is the circle of Altitude to an observer at the centre of the Earth (C), and the circle ZRL*g*E*h*, that of an observer at the surface (A); therefore as two circles not having the same centre, they must intersect each other (Euclid 5th, 3rd). (The above circles meet at the point *h*, on the horizon A*h*, which is parallel to C*d*, and the <*h*C*d*=A*h*C, (according to 27th, 1st Euclid). Therefore it is evident that these small angles or parallaxes of Altitudes, should be added to the Altitudes taken from the surface of the Earth, to make them agree with the central Altitudes.) The Parallaxes will decrease as the object approaches the Zenith, as is seen in the figure.

The horizontal Parallax of the Moon is irregular, on account of her oval periodical revolution round the Earth. The nearer she advances, the greater the horizontal Parallax will be, which variations are found in page 8 of the Month, in the Nautical Almanac for every noon and midnight, at the Meridian of Greenwich; but, as these horizontal parallaxes in the N. A. only refer to the Equator, and the semidiameter of the Earth varying according to the Latitude of the place, the equatorial horizontal parallax must require correction. It decreases from the Equator to the Poles: the mean reduction of it to each Latitude, either N. or S., is to be found in Table 22, which will be sufficiently accurate for any Nautical or Astronomical calculations.

The horizontal Parallax of the Sun is about 8½ seconds, and from his immense distance from the Earth, his variation, by the decrease of the equatorial semidiameter, is of little importance. His Parallax in Altitudes is laid down in Table 5.

The fixed Stars have no visible Parallax, the semidiameter being no more than a point, compared with their distance from the Earth. Therefore there is no change in their Altitudes from the surface to the centre of the Earth, except the difference arising from an oblate and true spherical horizon, (see page 1).

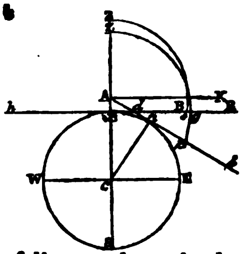
The Parallaxes of the Planets are found to vary according to their distance from the Earth, being sometimes more and sometimes less than that of the Sun, which variation may be ascertained by the Nautical Almanac, the figure of the Earth causing no visible change in any parallel of Latitude. Besides the errors abovementioned, there is another attending the Altitudes of every heavenly body, called the Refraction, which will be satisfactorily explained by the following very simple experiments:—

Place a piece of silver in a basin, and stand at a distance from it. Fix your eye steadily on some remarkable part of it. Then let another person gradually pour water on it, until it is covered. The piece will appear to change its first or true place, (the latter is called its apparent place,) and the angle the elevation of the piece makes with the eye, is called the Refraction. This also decreases according to the elevation of the eye on the horizontal line of the true place of the piece, or according to the elevation of that true place, until the eye is immediately over the piece or the piece over the eye: likewise, on putting a rod obliquely into smooth water, the part immersed will appear higher than that which is out of the water; raise the rod to make any angle you please with the surface, and you will observe that the part immersed will gradually become straighter, until by putting it in perpendicularly, both parts of the rod form a straight line, in which case there will be no refraction. When you form an angle with that part of the rod in the water, draw an imaginary line from your hand, making a straight line with the part out of the water. The angle this line makes with the part immersed, is the refraction of the angle it makes with the surface of the water. Some of our most eminent philosophers differ in their opinions respecting the calculations of the refraction, however there can be but little doubt that bodies differ in their refraction on various occasions, either from the density of the atmosphere or the brightness of the body. In foggy weather the refraction is very different to what it would be were the air clear; and in order to measure the state of the atmosphere, those who wish for accuracy, I would recommend to carry with them a thermometer and barometer. The refraction here given, is at the mean state of the atmosphere, when the barometer stands at 29 : 60 inches, and the thermometer 50° of Fahrenheit. In Table 12 will be seen the refractions corrected according to the change of the atmosphere, to every 10th of an inch of the barometer.* Philosophers have questioned whether the brightness of the object, or the quantity of atmosphere which surrounds it, raises the refraction;—in my opinion it is caused by the density of the atmosphere, for in the first experiment with a piece of silver, the greater the quantity of water poured on it, the higher will it appear to be elevated.

You will now proceed to another correction, called the Dip of the Horizon.

The Dip of the Horizon arises from an observer being elevated any number of feet, miles, &c. &c. above the true horizon. The higher the eye, the more will the object be raised, on account of the curvature of the Earth.

CONSTRUCTION AND DEMONSTRATION.



Let the circle xESW represent the Earth, and hR the true horizon. Then draw AK parallel to hR, and supposing an observer at A, his horizon would be AB, making the Altitude of the Sun too great by $<\mathrm{R}d\mathrm{B} = <\mathrm{A}dx$, for by the 36th, 3rd Euclid, the observer can ascertain the distance An, and in that situation the object makes an obtuse angle with his Zenith $= <\mathrm{ZA}p$, which is more than a right angle, or 90° by the $<gbd = <\mathrm{KAB}$, for AK is parallel to xg, and the straight line AB falls on them both, making $<$ at $\mathrm{A} = <d$, by 29th, 1st Euclid. Therefore, if the $<\mathrm{KAB}$ were taken from the obtuse $<\mathrm{ZAB}$, the remainder would be $= <\mathrm{ZAK} = 90° = <\mathrm{Z}xg = 90°$, that which it would measure if the observer were at the surface of the Earth, consequently the depression of the horizon must be subtracted from the observed Altitude, to obtain that Altitude taken at the surface of the Earth.

The depression of the horizon answering to the different heights of the eye, may be found in Table 4, calculated to the greatest nicety; and the distance An is obtained to any height by Euclid 36th, 3rd.

It is by this problem we prove the globe to be round, for in sailing towards the land, the mountains and lofty buildings are seen first, and on a nearer approach a greater portion of them is visible, but on your departure from it vice versa. The distance a ship is from land is estimated by the same problem, viz. by taking the Altitude of a mountain or any prominent object, whose distance from the shore is known,* then sailing to or from the object any given distance, and again taking the Altitude of it, the difference between the Altitudes and the distance sailed, will be the distance the vessel is from the shore. And lastly follows that correction, which in my succeeding pages, I will endeavour to convince the Navigator, will be of the greatest importance to him; and which will, on a careful investigation, prove the necessity there exists for new modelling some of our most highly esteemed works on Navigation.

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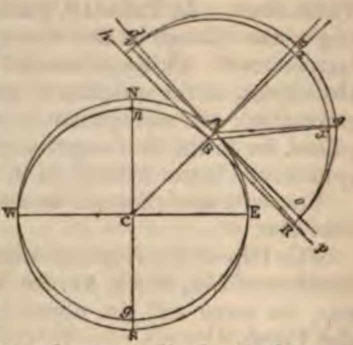
* It is evident that every Altitude must be diminished by the quantity of refraction answering to it in the Table.



Let the figure of the Earth be W N E *g*, the perfect Sphere W N E S, then in Latitude 45° = arch $\frac{N\,A\,E}{2}$ an observer at A makes *d* A *p* his Horizon, and the circle *d* Z *g p* his circle of Altitudes, Z being the zenith, and admit him to have the true Altitude of an object 45° = $\frac{Z\,g\,P}{2}$ = < *g* A *p*, then let the observer be at B, his Horizon will be *h* R, and his circle of Altitude *h* Z *x* R, Z being the zenith. According to the laws of gravity, all bodies tend towards the centre of the Earth, and stand perpendicular to its surface; therefore, the observer's Zenith is half his circle of Altitude: likewise half the observer's circle of Altitude at the surface of the Earth B = *h* Z *g* R will be at Z, which will fall, as the above figure proves, higher than the observer A's Zenith on the perfect Sphere N E S W. Again, let his Altitude be 45° on the arch Z R, = < *x* B R it is obvious the Altitude at B is less than that at A by the < A R B = R A *o* by 27th 1st Euclid; for A *o* is parallel to B R, the difference between the true and admitted horizon, which difference will be found answering to each Latitude in Table 31, and proves that former writers have been some minutes wrong in their calculations, because they asserted that the true form of the Earth made no difference in any operation. That they are mistaken in their opinion, I hope I have convinced the Navigator.

To find the Latitude by a Meridian Altitude of any object, according to the incorrect system usually adopted.

PROBLEM.—Having the observed Altitude of the Sun when on the meridian, and the day of the month given, find the true geocentric Latitude.

RULE.—Find the true Altitude of the Sun's centre, as laid down in the Use of the Tables, then, if the object be on the Equator, or is without declination, the Zenith distance is the Latitude of the place; but when the Zenith distance* and declination are of the same denomination, their difference is the Latitude, and when of different denomination their sum is the Latitude.

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* Lighthouses are the safest objects on which to depend, as they are generally built on the shore. Mountains or buildings might mislead the observer, especially in a strange land, where their distance from the shore might not be known.

NOTE.—When the declination is greater than the Zenith distanc the Latitude is of the same name with the declination; when less, it i of a contrary name, and when it is 90°, or at the Zenith, the Latitud is the declination.

EXAMPLE I.—Monday, September the 23rd, 1833, a ship at sea i Latitude 53° 10′ N. by account, and Longitude 72° East of Greenwic observed the Altitude of the Sun's lower limb 36° 40′, the height of th eye 20 feet above the sea, I demand the Latitude?

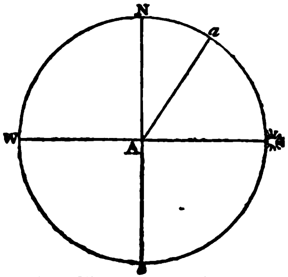
In Table 24, opposite 36° 40′ gives 36° 38′ 50″.
By the Nautical Almanac, ⊙'s semidiameter 15′ 59″
In Table 29, under 15′ 59″ and opposite 20 feet = - - . 4 16
00° 11′ 43″
36 50 33 True Al ⊙'s centr
Zenith dist. 53 9 27 or true L in N.

September 23rd, the ⊙'s declination at Noon, by the Nautical Almana at Greenwich, 00° 4′ 32″ S.

And in Table 15, Equation for 72° Longitude, East 4′ 32″, therefore th declination is 0° 00′ 00″ at that Meridian.

NOTE.—The declination to the common Table in this work, for finding the true Latitude, will answer very well, unless great accuracy b required.

Construction and Demonstration.



Let the circle NESW represent the Earth, and let the Sun be on the Equator, then lay the true Altitude from N to E = < NA*d*, then the Zenith distance will be dE, or the < dAE, hence the Latitude is at d.

NOTE.—All circles are considered to be described with the Chord of 60°, or the Sine of 90°, or with the Tangent of 45°: and all Altitudes are taken from the Chord of 60°, and laid on the arch from the elevated pole, when the Sun is on the Equator; for eve Altitude is the distance from that pole to the Zenith of the observer, more generally speaking, the Zenith distance, and the declination bein taken from the line of Chords, and laid from the Equator towards th pole, will extend to the true Latitude.

EXAMPLE II.—Suppose on the 23rd of September, 1833, a ship sea in Latitude 53° 10′ N., and Longitude 72° West of Greenwich b account, finds the meridian Altitude of the Sun's lower limb 36° 5 the height of the eye 20 feet above the surface of the sea, what is h Latitude?

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* The Zenith distance of any object is the number of degrees, &c. &c. that object either North or South of the observer's Zenith.

In Table 24, as before, opposite 36° 40′, Obs. Alt. 36° 38′ 50″ true Alt.
By N. A. ⊙'s Semidiameter, 15′ 59″. }
Under 15′ 59″, and opposite 20 ft. in Table 29, } 11′ 43″

True Altitude of 36 50 33 ⊙'s centre

Zenith distance 53 9 27 S.

By N. A., ⊙'s declination at Noon at Greenwich, is 00° 4′ 32″ S., and daily change 23′ 24″.

Equation to 72° Longitude and 33′ 24″ in Table 15, 0° 4′ 32″, which must be added to declination at Greenwich, 0° 4′ 32″ for it is increasing, gives - - - - - - - - - - 00° 9′ 4″ S.

True Latitude 53 0 23

EXAMPLE III.—Being at sea on the 23rd of September, 1833, in Latitude 53° 10′ N., and Longitude 0° 00′ by account, and observed the Altitude of the Sun's lower limb to be 36° 40′, the height of the eye being 20 feet above the level of the sea, I require the Latitude of the ship by observation.

Observed Alt. of ⊙'s lower limb 36° 40′, true Alt. 36° 38′ 50″ as before
Corrrections as before 11 43

True Altitude of the Sun's centre 36 50 33

Zenith distance - 53 9 27 S.
⊙'s declination Sept. 23rd, at Noon at Greenwich 00 4 32 S.

Latitude by Observation - 53 4 55 N.

EXAMPLE IV.—Being at sea on the 24th of July, 1833, in Latitude 43° 00′ N., and Longitude 30° West, and observing the Altitude of the Sun's lower limb to be 27° 10′, the height of the eye 20 feet above the level of the sea, I demand the Latitude by observation.

In Table 24, opposite 27° 10′, in the column of Obs. Alt. gives.
By the N. A. ⊙'s semidiameter 15′ 47″ - 27° 8′ 18″ for true Alt.
Corrections answering to which and 20 feet, Table 29 11 31

True Altitude of the Sun's centre 27 19 49

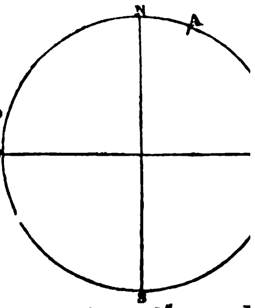
Zenith distance - - - 62 40 11 S.
⊙'s declination by the N.A. at Noon,
at Greenwich - - 19° 53′ 39″ N. }
Equation to 30° of Longitude 1 4 } 19 52 34 N.

Latitude in 42 47 37 N.

REMARKS.—When you are above 60° o Latitude N. or S., the Sun will be on your meridian twice in twenty-four hours; that is, at his greatest and least Altitudes, and at the latter Altitude he is below the Pole on the opposite meridian, in which case, you must add the complement of the declination to the meridian Altitude, for the Latitude of the place by observation.

Example V.—On the above-named day, the Altitude of the S lower limb below the Pole, was observed to be 12° 18′, I require true Latitude by observation.

Construction and Demonstration.



Let the figure NESW represent the Earth as before, and let the Sun be below the Pole at ○=19° 46′ 11″ N. declination, and the Altitude 12° 25′ 19″, then the Zenith distance will be 77° 34′ 41″, which lay off from the ○ towards the North, and it will reach across the pole to A, for the pole is between the observer and the Sun. Then the Zenith distance will be=A○=77° 34′ 41″+○W (the declination),=19° 46′ 11″=97° 20′ 52″ =AW, then take AW from the semicircle ENW, or 180°, and you have 180°-97° 20′ 52″=82° 39′ 8″ true] tude of the ship (A) by observation.

Table 8, opposite 12° 18′ in Obs. column, gives 12° 13′ 48″ Altitude.

Correction answering to ☉'s Semid. 15′ 47″ and 20 ft. - 11 31

12 25 19

○'s declination at the given Meridian 19° 52′ 34″
Variation to 12 hours and daily diff. 6 23

True Declination at the given time 19 46 11 Compt. 70 13 49]

True - 82 39 8]
L

Remark.—It must be observed that the Moon once in a luna or 12 times in the year, comes to the meridian twice in 24 hours, likewise that some Stars never set in high latitudes, for which reas would be advisable to pay particular attention to the above rem which will enable you, when an opportunity offers, to find your Lat twice a day by a Meridian Altitude, either of the Sun, Moon, or S

It is obvious that if an observer be at the pole, his altitude will b declination of the object, and as many degrees, &c. &c. as he rec from the pole, he raises the object or increases the Altitude.] hence the Altitude of the Sun at the pole in the above problem, w 19° 46′ 11″=declination; but the Altitude from the place of observ A, is 12° 25′ 19″, therefore 19° 46′ 11″—12° 25′ 19″=(7° 20′ 5 NA, or the complement of the Latitude at A, or complement 19° 4(=declination* 12° 25′ 19″=true Altitude=82° 39′ 8″ Latitude.

The Latitude may be found by the Meridian Altitude of any Star, whose declination is known.

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[*] The Parallaxes of the fixed Stars are at all times invisible, as well as their (ter, therefore the correction of their Altitudes for Dip and Refraction is gi Table 19.

Example.—Nov. 20th, 1833, a ship in Latitude 60° 11′ N. by account, and Longitude 45° W. of Greenwich, and at 19h 1′ 16″ Nautical time, finds the Observed Meridian Altitude of Regulus 37° 35′ 00″ S., the height of the eye 30 feet above the sea; required the Latitude.

	37° 35′ 00″	Obs. Alt.
Corrected by Table 19, to 37° 35′ and height 20. - -	5 56	
True	37 29 4	S. Alt. of Star.
Zenith distance -	52 30 56	S.
Star's declination -	12 46 51	N. by Table 23
Latitude -	65 17 47	N.

Previous to giving the calculations for finding the Latitude, I will refer the Navigator to Table 22, that he may ascertain the Nautical time of any Star coming to the Meridian, when he may without delay, know at what time to take his Meridian Altitude.

To find the Latitude by the Meridian Altitude of the Moon.

In page 6th of the month in the Nautical Almanac, you will find the Moon's declination and the time she passes the Meridian of Greenwich, on that day; convert the Longitude into time by Table 24, add it to if West, subtract if East, from the above time, their sum or difference will nearly be the time she passes over the Meridian of the place of observation.

Second In page 7th of the month in the N. A., find her semidiameter and horizontal parallax at the reduced time, or at the time she passes the Meridian of the place; find the reduced declination, semidiameter, and horizontal parallax, then from Table 25, take the corrections answering to the Moon's apparent Altitude and horizontal parallax at the reduced time, which added to her observed Altitude, gives the true Altitude: having done this, take from Table 9, the corrections answering to her semidiameter and the height of the eye, which added to, or subtracted from, acccording as the upper or lower limb is taken, their sum or difference will give the true Altitude of her centre.

Example I. — On the 26th of September, 1833, in Latitude 10° 20′ N. and Longitude 45° 00′, both by account, with a quadrant well adjusted, I found the observed Altitude of the Moon's lower limb when on the Meridian south of me, to be 67° 43′ 30′, the eye being 20 feet above the level of the sea: required the Latitude by observation.

By the N. A. on this day, the Moon passes the Meridian of Greenwich at 10h. 45m. P.M. + 45° of Longitude, in time gives 13h. 45m, or 1h. 45m. A.M., the time she passed the Meridian of observation.

The Horizontal Parallax at midnight being 54′ 1″, and at reduced time 54′ 1″, semidiameter 14′ 43″, and at reduced time 14′ 43″.

In Table 25, opposite Observed Altitude 67° 43′, and under reduc
Horizontal Parallax, gives - - - - - - + 19 55″

☽'s Observed Altitude -		67 43 30
True Altitude of lower limb		68 3 25
Corrections to 14′ 43″ semi. and 20 feet, height of the eye		+ 10 27
True Altitude of her centre		68 13 52
Zenith distance - -		21 46 8
		10 48 40
☽'s declin. at midnight at Greenwich	11° 6′ 41″S.	
Equation to 1h. 45m. difference of time between ship and Greenwich	18 1	10 57 28

Remark.—As the Moon's declination is given to every three ho answering to the Meridian of Greenwich, proportional parts must taken for any intermediate time, (which must be added or subtract according as the declination is increasing or decreasing,) but, accuracy be required, this proportional part must be correc by the Table of Second Differences. See the Explanation and use the Tables.

Example II.—On the 30th of November, 1833, in Latitude 25° N., and Longitude 30° 42′ E., I observed the Meridian Altitude of Moon, and found it to be 40° 32′ N., the eye being 16 feet above surface of the sea. Required the Latitude by observation.

By N. A. this day, the Moon passed the Meridian of Greenwich 3h. 29m. A.M.+30° 42′ E. Longitude, in time gives 1h. 27m. after m night, she passed the Meridian of the place of observation. Her Horizo Parallax at midnight is 58″ 37′, semidiameter 15′ 58″, her Parallax at redu time 58′ 38″, semidiameter at reduced time 15′ 58″.

In Table 25, opposite 40° 32′ Observed Altitude, and reduced Horizo
Parallax 58′ 38″, is - - - - - - - - - + 43′ 26″

Observed Altitude of the Moon's lower limb		40 32 00
True Altitude of her lower limb		41 15 26
Opposite Semidiameter 15′ 58″, and height of the eye 16 feet, in Table 9, gives - - -		+ 12 19
True Altitude of her centre -		41 27 45
Zenith distance - - -		48 32 15
Declination at midnight by N. A.	22° 49′ 48″ N.	
Variation to 1h. 27m. difference of time between the ship & Greenwich	5 28	22 44 20
Latitude in		25 47 55

The Latitude may be found by the Meridian Altitude of the pla when observed on the Meridian, but as they generally come to it s after or before the Sun, they are rendered invisible by the brillianc his rays, even with the help of a telescope; some writers recommend their use, in finding both the Latitude and Longitude, but I appeal to the practical Navigator and men of science, whether any beneficial results can arise from the introduction of a system so imperfect and useless:—the above remark will shew my reason for neglecting the subject.

The foregoing Latitudes are found according to the method used at present by all Navigators, by which they likewise obtain their true time, amplitudes, azimuths, and all Geographical and Nautical calculations.

In page 6, every Altitude near Latitude 45° North or South, is about 11′ 14″ too little, so that the Altitude observed there, clear of refraction, &c., when there is no declination, is 44° 48′ 46″, and the Latitude there by observation from the surface of the Earth, would be 45° 11′ 14″, which is 11′ 14″ incorrect. Therefore every Latitude found by observation, according to the usual plan, must be too much or too little, by the quantities or corrections given in Table 31, in the 1st column. And, unless these corrections be adopted, the true time found by calculation will be wrong in every instance. Also, in comparing that time to the time at Greenwich, found by Lunar distances in the N. A., it will cause an error in Longitude of 15 minutes to every minute of error in the time at ship.*

Likewise the variation of the compass, the rising and setting of the heavenly bodies, where accuracy is required, will be in error if the Geocentric Latitude be not used.

The following are the foregoing Latitudes referred to, with their corrections, taken from Table 31.

Example 1st,	Latitude found 53° 9′ 27″	Geocentric Lat. 52° 58′ 39″
2nd,	53 0 23	52 49 37
3rd,	67 17 47	67 9 42
4th,	53 4 55	52 54 7
5th,	42 47 37	42 36 27

NOTE.—Correct all Latitudes in like manner, or if you can depend on that by account to be within 1° of the truth, take the number answering to it from Table 31, and add it to, or subtract from, the correct Meridian Altitude, for the true Meridian Altitude, and you will find the true or Geocentric Latitude, by which all other Nautical calculations will be found to the greatest degree of exactness.

OBSERVATION.—When the object is between the observer and the Equator, the corrections are to be added to the observed Altitudes, and subtracted when the object is between him and the pole; or, if the Latitude be found as usual, enter the Table 31 with it, and take out the corrections answering to it, which must be added to the Latitude, if the object be between the observer and the elevated pole, and subtracted, if between him and the Equator, as is demonstrated in page 6.

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* See the method of finding the True Time, page 27.

A method of finding the Latitude by two Altitudes of any heavenly bodies, having the Latitude by account, and the time between the Observations and the Declination given.

Opportunities frequently occur for taking Lunar observatio or five hours from the Meridian, and that with the ○ and latter in her first and last quarter, at which time the true time being required, we will proceed to shew, that in such cases it is sible to obtain it by the Latitude found by the former metho which all Nautical works are furnished.

EXAMPLE I.—Suppose a ship at sea in Latitude 48° 20' account, when the Sun's declination is 22° 40' N., finds the true of the Sun's centre when corrected, to be 58° 43', at 1h. 30m. and from the same station finds his true Altitude to be 43° 1', at 3 P. M. I demand the true Latitude.

The following is one of the usual methods:

	h. m.		° '			° '	
	1 30 0	Alt.	58 43	N.S.	85464	Lat. 48 20 N.	Sec.
	3 20 0	Alt.	43 1	N.S.	68220	Dec. 22 40 N.	Sec.
El. T.	1 50 0				17244	Log ratio - -	
						its com. Log. -	4
	0 55	its Log. from col.			half elapsed time - - -		
	2 25						
		in col. mid. time			- - - - - - - -		
True time	1 30						
T. P. W.	3 20	Log rising			- - - - - - - - - -		
					Subtract Log ratio -		
W. slow	1 50						
						N. N.	

			4670
			85464
Meridian Altitude	64 20	N. S.	90134
Zenith distance -	25 40		
○'s declination -	22 40		
	48 20	N. Latitude.	

EXAMPLE II.—Supposing a ship at Sea in Latitude 2° 1 account, and the true Altitude of the Sun's centre at 4h. 50m 17° 31' 28", and at 5h. 30m. his Altitude was found to be 7° 3 at P. M., his declination being 1° 3' N.; find the true Latitud ship.

	h. m.	° ′ ″		Lat. by account 2° 10′ N.	Sec. 0.00031
	5 30	Alt. 7 32 00	N. S. 13111	Dec. 1 3 N.	Sec. 0.00007
	4 50	Alt. 17 31 28	N. S. 30111		
				Log. ratio	0.00038
El. T.	0 40		17000	its com. Log.	4.23045
½ E.T.	0 20			its Log. in col. ½ elapsed time - -	1.05970
	5 9 49			in col. Mid. time - - - - -	5.29053
	4 49 49			Log. rising - -	4.84419
				Sub. Log. ratio -	0.00038
			69793	N. N.	4.84381
			30111	N.S. gt. Alt.	
	Meridian Alt.	87 29 N. S.	99904		

Zenith distance 2 31 S.
Declination - 1 3 N.

Latitude in - 3 34 N.

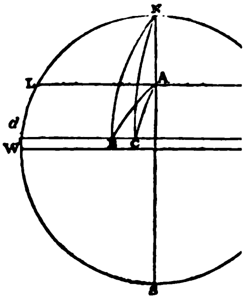
As the Latitude found, 3° 34′ N., differs widely from that by account, it is advisable to repeat the operation, using the last Latitude found.

		Latitude 3° 34′ N.	Sec. 0.00084
		Declin. 1 3 N.	Sec. 0.00007
		Log. ratio	0.00091
			4.23045
	h. m. s.		1.05970
½ E. T.	5 11 5		
	20 0	Mid. time -	5.29106
	4 51 5	Log. rising -	4.84745
		Sub. Log. ratio	0.00091
		70233 N. N.	4.84654
		30111 N. S. Gr. Alt.	
		100344	

In this method we are recommended to repeat the operation, using the last Latitude found, until it nearly agrees with that used in the operation; and as the Latitude 3° 34′ differs 1° 24′ from 2° 10′, or that used in the problem, it is repeated, by which we find the N. S. of the Meridian Altitude to be 100344, which is absurd, for such a number is not the N.S. nor the N.C.S. of any part of the quadrant. And, although this method may be used near the Meridian, the errors are increasing, as the observations are made further from it, in low Latitudes and low Declinations. How, therefore, I would ask the practical Navigator, can this system be depended on, especially if the apparent time of observation be more than 3h. from noon. All those works on Navigation which use the Latitude by account, must on examination be ascertained to be in like error.

The following is a correct and general mathematical metho obtaining the true Latitude by two Altitudes of the Sun, Moon or whose declinations may be known, (having the elapsed time between the observations by a common watch or any time ke or by a single Altitude of two Stars, whose right Ascensions and] nations are known.

Construction and Demonstration.



Describe the circle and quarter it, let WE be the Equator, *dc* the parallel of declination, L*a* that of the Latitude, and A the place of the ship at the second observation, CA the complement of the first corrected Altitude, BA that of the second, and CN, BN the polar distance at the two observations; the angle BN*c* will be the elapsed time, and AN the colatitude required.

The method of calculation will be with the two sides BN and CN, and the including angle BNC. Find the side BC, then with the three sides find the NBC, and in the triangle BAC; having the three sides given, fi angle ABC, then take the angle ABC from the angle NBC, and yo the angle NBA, then with the two sides NB, NC, and their inc angle NBA; find the side NA, which is the Co. Latitude require

RULE.—To the Log. sines of both polar distances at the two vations, add the Log. VS of Elapsed time, their sum, rejecti from the index, will be the Log. V, S of an arc, called BC; again, Log. Tangent of the polar distance at the first observation, a Log. tangent of half BC, their sum, rejecting 10 from the index, the Log. co-sine of an angle, which call < A;* then from half th of BC and both Altitudes, take the greater Altitude, then to the co- of BC, secant of less Altitude, co-sine of half sum, and sine of t difference, add the constant Log. 0·30103, their sum, rejecting 1 the index, will be the Log. V, S of an angle; which call < B, ag the Log. VS of the difference between < A and < B, add the co- the declination at the first Altitude, and co-sine of the greater A their sum, rejecting 20 from the index, will be the Log. of a N, N taken from the N, C, S of the difference of that declination and les tude, for the N, S of the true Latitude.

The two following problems are the same as before, and are by this method, admitting the globe to be a perfect sphere as for

EXAMPLE I.—*(See page 13.)*

El. T.	1h. 50m.	Log. rising	4.05304	Tang. -	9
Declin.	22° 40′	Co-sine × 2† =	9.93018	Tang. ½ BC	9
BC = 25° 20′ 30″		VS	3.98322	∠ A, 84° 36. 52″ co-s.	8

---

* ∠ A may differ in some instances from the truth in this calculation it is o sidered one of the ∠ s of an isosceles spherical triangle, differing always by th in the declination during the elapsed time, but to admit it as above with the su make but a very trifling difference.

† The declination does not change during the elapsed time, therefore co-sin equal to twice the sine of the PD at both observations.

BC.	25°	20′	30″		Co-secant	0.36854
Less Alt.	43	1	00		Secant	0.13599
Great Alt.	58	43			+	0.30103
	127	4	30			
	63	32	15		Co-sine	9.64895
	4	49	15		Sine	8.92449
< B	40	28	34		V S	4.37900
< A	84	36	52			
+	44	18	18	Log.	V S	4.45077
Less Alt.	43	1	00		Co-sine	9.86401
O 's decl.	22	40	00		Co-sine	9.96509
Diff.	20	21		19055	N.N. =	4.27987
		N. C. S.		93759		
				74704	N. S.	48° 21′ N., true Lat. of the ship.

Example II.—*(See pages* 13-14.*)*

El. T.	0h. 40m.	Log. rising	3.18162	Tang.	8.26311
Declin.	1° 3′	Co-sine + 2	9.99986	Tang. ½ BC	8.94187
BC.	9° 59′ 57″	VS	3.18148	<A 89° 55′ co-sine	8.20498

BC.	9°	59′	57″		Co-secant	0.76041
Less Alt.	7	32	28		Secant	0.00376
Gr. Alt.	17	31	00			
	37	3	25		+	0.30103
	17	31	42		Co-sine	9.97935
	00	00	42		Sine	5.79927
< B	2	8	0		VS.	1.84382
< A	89	55	0			
x	87	47	0	Log.	VS.	4.98421
Less Alt.	7	32	0		Co-sine	9.99623
☉'s Dec.	1	3	0 N.		Co-sine	9.99993
Diff.	6	29	N.C.S.	95579	N.N.	4.98037
				99360		
				3781	N.S.	2° 10′ N. true Latitude the ship.

Remark.—On comparing the Latitude found by Problem 2nd, page 13, 14, with the above, the error will be too obvious to escape the notice of the most careless observer. It is well known that opportunities frequently occur, both morning and evening, for taking Lunar Observations; but if the usual method for finding the Latitude at Ship be relied on, the time found from that will be considerably in error, and, indeed, all other Nautical calculations founded on such an incorrect system, must be wrong, therefore I hope this caution will be sufficient for the mariner.

As the preceding problems are given on the supposition of the globe being a perfect sphere, and the Altitudes taken at one station, I will now proceed with the calculations according to the spheroidical figure, admitting the ship under way during the elapsed time.

Let us observe that a ship is generally under way during her time of observation, and in that case she makes it at two different stations, consequently each station must be in a certain latitude, unless she sail on a parallel, that is due East or West, and our object must be to find her latitude at the last station, which will give us the true time at that meridian.

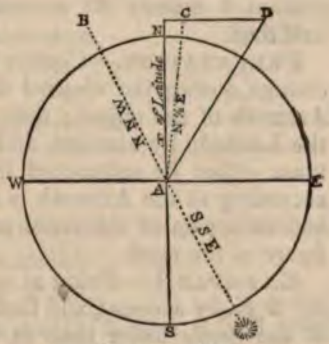
Under such circumstances, the following remarks and instructions are to be observed:—

If a ship sail towards that point of the compass on which the Sun bears, she raises the Sun's Altitude as many minutes, as the miles she runs in that direction; and if she sail from the Sun, she decreases his Altitude in like manner. Therefore the miles run towards the Sun must be added to the first Altitude, and in sailing from the Sun the same must be subtracted. This being done will give both Altitudes, as if they were taken from the same or last station of the ship.

Again, during the elapsed time, a ship generally makes a difference of Longitude, unless she sail on a meridian, in which case she increases the elapsed time, at the rate of 1 hour to every 15° of Longitude if it be West; but if she sail Easterly, she decreases it at the same rate.

This is illustrated by the two following Examples.

Example I.—Suppose a ship at sea finds the sun to bear S.S.E. at 11 hours 30 minutes, A.M., the time of the first observation; during the elapsed time she sails N. ½ E., at the rate of 10 miles an hour, and at 1h. 00′ 00″ P.M. takes a second observation. Find how much she decreases the first Altitude.



Let the circle represent the compass NSEW, and A the ship's place at the first observation, at which time the Sun bears SSE, the opposite point to which is NNW, and the ship sailed during the elapsed time N½E, making an angle with the Sun of 2½ points, equal to the angle BAC. The elapsed time being 2 hours, 30 minutes, sailing at the rate of 10 miles an hour, gives 25 miles sailed during the elapsed time.

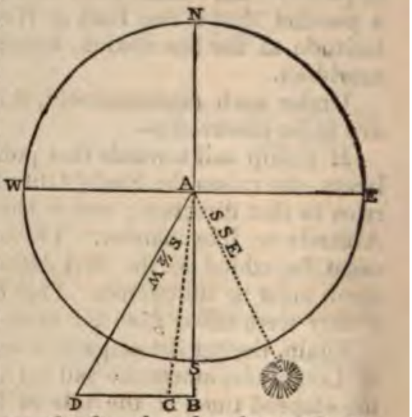
Lay the angle you make with the Sun during the elapsed time from the meridian AN, which will be equal to angle NAD, then lay the distance run from A to D, and you will find the ship at D, dipping the Sun by the quantity or distance AN during the elapsed time, being 22 miles. The departure being East, reduced to the difference of Longitude either by

Mercator or Middle Latitude sailing, must be added to the elapsed time, which will give the true elapsed time; and the 22 miles you dip the Sun during that time, is to be subtracted from the first Altitude, which will reduce it to what it would have measured at the last station.

Example II.—On sailing towards the Sun.

Suppose the ship sailed S. ½ W. during the elapsed time in the foregoing problem; I wish to know how much she increased the Sun's Altitude when taken at the first Altitude.

Construct the compass as before, and lay the Sun's bearing at the time of the first observation from S. to E. equal to 2 points. Lay the ship's course S. ½ W., from S. W. equal ½ a point. Then the angle the ship makes with the Sun during the elapsed time will be ☉AC; then lay this angle equal to 2½ points from the meridian towards the West, and you will have the angle BAD; lay the distance run, during the elapsed time, 25 miles, from A to D, then the ship's place will be at D, and the distance from A to B equal to 22 miles, having raised the Sun during the elapsed time.



This 22 miles added to the first Altitude, will make it the same as at the last station, and the departure being West, (reduced to the difference of Longitude,) when subtracted from the elapsed time, gives the true elapsed time. The corrections, elevations or depressions required in this problem, may be found under the angle the Sun makes with the ship during the El. time; opposite the distance sailed during that time, in the Table of Different Latitudes and Departures in a Latitude column, and unless the difference of Longitude be very great, it does not much signify whether you correct the elapse time by it or not. It is most necessary in high Latitudes, for even in the Latitude of 60 N., or 60 S., 12 miles of either Easting or Westing, change 1 minute 36 seconds of time, and near the Equator about half that.

Preparation.—Correct the Altitudes as before, the first by the change during the elapsed time, and when taking them, observe the Azimuth of the object; then enter Table 31 with that Azimuth, and the Latitude by account, and take the number answering to it, which must either be subtracted from or added to the corrected Altitude, according as the Azimuth is more or less than 90° from the meridian, and their sum or difference will give the true Altitude, corrected for the figure of the earth.

Example I.—Being at sea on the 17th of May, 1833, in Latitude 50° 5′ N. by account, and Longitude 77° 45′ W., I observed the Altitude of the Sun's lower limb at 6h. 56′ 30″ A.M., to be 23° 35′, his true Azimuth per compass, corrected for variation, was 90° 28′ from South to East. In a moderate gale and cloudy weather, sailed N.E. by N. ¾ E.

---

* The true Azimuth within 2° of the Zenith will be sufficiently accurate, and may be observed with an Azimuth compass corrected for the variation.

with my starboard tacks on board, at the rate of 10′ miles an ho making 1½ point of leeway, and at 10h. 36′ 30″ A.M., I observed t Altitude of the Sun's lower limb to be 54° 46′, his true Azimuth bei 36° 42′ from South to East; the height of the eye being 18 feet abo the surface of the sea: required the true Latitude of the ship, admi ting the earth an oblate spheroid.

First Observed Altitude - - -	23° 35′	Second	54° 4
Cor. from Table 31, answering to 50° Lat. and 90° 28′ Azimuth - - -	00	& 36° 42′ Az.	
Cor. Altitude for the figure of the Earth	23 35		54
Cor. Altitudes from Table 9 - -	23 33 11		54
Correct Altitudes -	23 44		55

During the elapsed time the ship makes an angle of 2¼ points wi the Sun, with which, and the distance during that time = 33, course and distance; find the difference of Latitude and departu which will give difference of Latitude 29′, this 29′ added to the fi Altitude 23° 44′

+ 29

Gives 24 13 the first Altitude corrected for the E. T.

The Sun's declination at Noon, at the meridian of Greenwich that day - - - - - - - -	19° 20′
Corrected from Table 15, answering to 77° 45′ W., and apparent time 6h. 56′ 30″ - - - - - -	+ 6
True declination at the first observation - -	19 26
Variation to elapsed time - - - - -	+ 3
Sun's declination at the second observation -	19 29

Elapsed time -	3h. 40′	Log. rising	4.62984	Tangent	9.547
☉'s P. Dist. 1st Obs.	70° 34′	Sine	9.97452		
☉'s P. Dist. 2nd Obs.	70 31	Sine	9.97439		
B. C. - -	51 38	Log. V.S.	4.57875	Tang. ½ B.C.	9.684
				A. 80° 11′ Cosine	9.232

B. C. -	51° 38′	Co-secant	0.10565
Less Altitude	24 14	Secant	0.04006
Great Altitude	55 6		
	130 58	+	0.30103
	65 29	Co-sine	9.61800
	10 23	Sine	9.25514
∠ B. -	37 42	V. S.	3.81042
∠ A. -	80 11		
X. -	42 29	V. S.	4.42435
Less Altitude	24 14	Co-sine	9.95994
Declination	19 26	Co-sine	9.97452
		22850 N.N.	4.35891
	4° 48′ N. C. S	99649	
		76799 N. S.	50° 10′ N. true Lat.

Example II.—On the 20th May, 1833, being at sea in Latitude 51° 30′ N. by account, and Longitude 110° W., with a quadrant well adjusted, I took the observed Altitude of the Sun's lower limb about 6h. in the morning, and found it to be 15° 32′, bearing by compass (corrected for the variation) 102° 58′ S. In a high gale and stormy weather, sailed S. by W. ¼ W., with my larboard tacks on board, at the rate of 8 miles an hour, making 1¼ point of leeway, and in the space of three hours after the observation, I found an opportunity of taking again the observed Altitude of the Sun's lower limb, and found it to be 42° 53′, bearing by compass (corrected as before) 64° 56′ S., the height of the eye being 19 feet above the sea. Required the true Geocentric Latitude of the ship at the last observation.

First Altitude	15° 32	Second	42° 53
Cor. from Table 31, to Lat. 51°, and Azimuth 103°	2	And 65° Azi. +	4
True Obs. Alt. cor. for the figure of the Earth	15 30	Do.	42 57

The ship sailed 12 points from the sun during the E. T., which with the distance run, 24′ as a course and distance, gives, in the traverse Table, under 4 points and opposite dist. 24′ in a Lat. column, 17 miles for a correction to be deducted from the first Altitude 15° 30′, gives 15° 13′ for the first Altitude corrected for the E. T.

By Table 24, Observed Altitude	15° 13	And 42° 57	
in column of Correct Altitudes will be	15 10	42 56	True Altitud
Corrected from Table 29 -	+ 12	+ 12	
	15 22	43 8	

☉'s Declination by the N. A. at the Meridian of Greenwich, at No

	19° 59′	N.El.T.3. Log. rising	4.46671 Tang. 9.561
Var. to 100° W. Long. & 6h.	+ 1		
Declination at the estimated meridian of the ship at 1st obs.	20 00	Co-sine	9.97299
Var. to 3h. El. time	6		
Decli. at 2nd Obs.	20 6	Co-sine	9.97271
B.C.=42	9	V.S.	4.41241 Tang.½BC 9.61
	∠A. 81° 20′	Co-sine	17

B. C.	42° 9′	Co-sect	0.17323
Less Alt.	15 21	Sect	0.01578
Great Alt.	43 8		
	100 38	+	0.30103
	50 19	Co-sine	9.80519
	7 11	Sine	9.09706
∠ B.	41 8	V. S.	4.39229
∠ A.	81 20		
X.	40 12	Log. V. S.	4.37430
Less Alt.	15 21	Co-sine	9.98422
☉'s declin.	20 00	Co-sine	9.97299
		21455 N. N.	4.33151
X.	4 39 N. C. S.	97671	
	Diff.	76216 N. S. 51° 27′ N. Latitu	

It frequently happens that the Sun is not over the horizon at time the Latitude is required, and especially at night, when a Lu Observation is to be taken, in which case find the Latitude by t Altitudes of any known Star, as well as by the Sun, or by the Altitu of any two known Stars, taking the difference of their R. A. as El. Time.

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* By due application to the foregoing Problem, the Mariner or Pupil may rea find the Latitude in any case required.

THE TRUE AMPLITUDE AND AZIMUTH.

The true Amplitude is the number of degrees the centre of any of the heavenly bodies, rises or sets from the true North or South, or speaking mathematically, it is an arch comprehended between the true N. or S. points of the horizon, and the centre of any of the heavenly bodies at their rising or setting, and may be called the horizontal Azimuth.

The magnetic Amplitude is the number of degrees the centre of any of the heavenly bodies rises from the N. or S. points of the compass, and is found with an Azimuth compass.

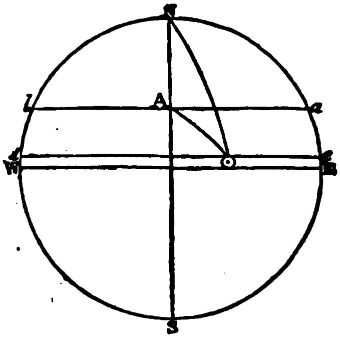
The true Azimuth is the number of degrees the centre of any of the heavenly bodies, bears from the true N. or S. at the time of observation; or, mathematically speaking, it is an arch of the horizon, contained between the meridian of observation and the Azimuth circle passing through the centre of the heavenly body at that time.

The magnetic Azimuth is the number of degrees the centre of the heavenly bodies, is from the N. or S. points of the compass at the time of observation.

Case.—Having the Latitude of the place of observation, the Sun's declination and the Altitude of any one of the heavenly bodies given; find its true Azimuth.

*Construction and Demonstration.**

Describe the circle and quarter it, let **WE** be the Equator, *de* the parallel of the declination, *la* the Latitude of the place of observation, and **A** the place of the observer. **A**⊙ the Zenith distance, **AN** the colatitude, and **N**⊙ the Polar distance, then the true Azimuth of the Sun from the N., will be the angle **NA**⊙ which is required.



The formula will run thus:—

Let **N A** be = **H**, **A** ⊙ = **H**, **N** ⊙ = *d*, then will the V. S.

$$< A = \frac{\text{sine}\ \frac{d+h+H}{2} - H}{\text{sine}\ H.} \quad \frac{\text{sine}\ \frac{d+b+H}{2} - b}{\text{sine}\ b.} + 2$$

In words:—From half the sum of the Co-latitude and Polar distance, take the Co-latitude and Co-altitude separately, then to the Co-secant of the Co-latitude and Co-altitude, rejecting tens from their Index, add the Log-sine of the two remainders, more the constant Log. 0.30103, the sum of these five Logs., rejecting 15 from their Index, will give the Log. V. S. of the true Azimuth.

Example I.—Suppose a ship at sea in Latitude 51° 32′ N. Longitude, 65° E., on the 6th August, 1833, at 3h. 5m. 9s. P.M., fin Altitude of the Sun's lower limb to be 39° 38′ 44″, the height eye above the surface of the sea 21 feet, his declination th 16° 44′ N. at Noon at Greenwich, I demand the Azimuth.

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* As the Construction of such cases are properly taken from Spherical Geometry, I have only given the nature of the Problem, which will be sufficiently explicit.

The true Altitude will be 39° 28′, and the Sun's declination reduced time will be 16° 37′.

Polar distance	73° 23′		
Co-altitude -	50 32	Co-sect	0.11239
Co-latitude -	38 28	Co-sect	0.20617
	162 23		0.30103
	81 11½		
	30 39½	Sine	9.70740
	42 43½	Sine	9.83154
True Azimuth from the North 116° 8′ V. S.			5.15853

EXAMPLE III.—Admit a ship at sea in Latitude 42° 16′ Longitude 20° 10′ W., on the 13th October, 1833, at 8h. 15 A.M., found the Altitude of the Sun's lower limb to be 18° 30′ height of the eye above the sea being 20 feet, and the declin the Sun that day 7° 47′ S. Required the true Azimuth.

The true Altitude of the Sun's centre will be 18° 40′, and the nation at the Meridian of the ship, at the reduced time, 7° 38′ S.

Polar distance	97° 38′		
Co-latitude -	47 44	Co-sect	0.13076
Co-altitude -	71 20	Co-sect	0.02347
	216 42		
	108 21		0.30103
	60 37	Sine	9.94010
	37 1	Sine	9.77963
True Azimuth from North 119° 46′ V. S.			5.17509

The above two problems are given on the supposition globe being a perfect sphere. They may answer either in N South Latitudes, and must be named from the pole nearest the ver East or West, according as the observation is taken be after noon.

The Azimuth of the other Heavenly bodies may be ascerta the same manner.

I have before demonstrated that the Earth is not a perfect consequently the Azimuth must require the same correction* as the preceding propositions, for which observe the following remarks:

With the Azimuth found on the former supposition, enter Table 31, and correct the given Altitude by the number found answering thereto, and the Argument Latitude. Find likewise the Geocentric Latitude if not done before, and proceed as follows:

PROBLEM I.—(*See page* 23.)

Argument Lat.	51° 32′	Altitude	39° 28′	
Correction -	— 11	Correc.	+ 5	answering to 116° Az., and [Lat. 52°.
Geocentric Lat.	51 21	Cor. Alt.	39 33	agreeable to the figure of the [Earth.

Co-latitude	38° 39′	Co-secant	0.20442
Co-altitude	50 27	Co-secant	0.11291
P. Dist. -	73 23		
	162 29		0.30103
	81 14½		
	42 35½	Sine -	9.83044
	30 47½		9.70920
True Azimuth from the North	116° 13′	V.S.	5.15800
Azimuth found as before	116 8		
Difference from the Truth	— 5		

EXAMPLE II.—(*See page* 23.)

Argument Lat.	42° 16′	Altitude	18° 40′	
Correction -	— 11	Correc.	+ 6	answering to 120 Azi.&Lat. 42°
Geocentric Lat.	42 5	Cor. Alt.	18 46	agreeable to the figure of the [Earth.

Co-latitude	47° 55′	Co-secant	0.12950
Co-altitude	71 14	Co-secant	0.02372
P. Dist.	97 38		
	216 47		0.30103
	108 23½		
	60 28½	Sine -	9.93959
	37 9½	Sine -	9.78105
True Azimuth from the North	119° 45′	V.S.	5.17489 agreeable to the figure of the Earth.
Azimuth found, page 23	119 46		
	— 1	difference from the truth.	

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* Unless great accuracy be required, the former method may answer very well in the science of Navigation, as the intention thereof is to find the variation of the compass.

The following is the usual method for finding the Amplitude, or horizontal Azimuth.

If you wish to discover the true Azimuth of any of the heavenly bodies at their rising or setting, you must find the true declination at that time, as directed before; then to the secant of the Latitude of the place of observation, add the sine of the declination, their united sums, rejecting ten from the Index, will be the Log. Co-sine of the true Amplitude, which, like the Azimuth, must be in one name with the Latitude.

EXAMPLE I.—

In Latitude 51° 32′ N., the Sun's declination being 16° 39′, what will be his horizontal Azimuth, commonly called Amplitude at his rising.

Latitude	51° 32′ N.	Secant	0.20617	
Declin.	16 39 N.	Sine	9.45716	
True Am.	62 34 from N.toE.	Co-s.	9.66333	on the supposition of the [Earth being a perfect sphere.

To find the Amplitude agreeable to the figure of the Earth, enter Table 31 with it, and find the correction under the Argument Latitude, which must be applied as the Table directs; thus:

Opposite 62° Azimuth and 52° Latitude, gives 5′ for correction, which is to be subtracted from all the Altitudes observed in that Azimuth, therefore the Altitude observed at this time from the surface of the Earth is nothing, consequently the Sun is 5′ below the Horizon, so that the Zenith distance in this case must be 90° 5′.

The Argument Latitude 51° 32′ corrected, gives 51° 21′ for the Geocentric Latitude.

By the former Formula, agreeable to the figure of the Earth.

P. Dist. -	73° 21′			
Zenith Dist.	90 5		Co-secant	0.00000
Co-latitude	38 39		Co-secant	0.20442
	202 5			0.30103
	101 2½			
	10 57½			9.27897
	62 23½			9.94750
		62° 35′	V. S.	4.73192
Amplitude in Example 1st.=		62 34		
Diff. from the truth -		.. 1		

In several cases the difference will be greater and of more importance than that above.

REMARKS.—Besides this error in the Amplitudes, as calculated in some of our modern works, there is another in the usual plans for taking the Magnetic Amplitudes by an Azimuth compass, when the Sun's centre is on the Horizon, which the following remarks will prove.

The Refraction of the Horizon is about 33′, and the Semidiameter of the Sun about 16′. When his lower limb is apparently touching the Horizon, the upper limb is correctly about 1′ below it, therefore the Magnetic Amplitude taken in the usual manner must be wrong, there being a difference between the bearing of the Sun's true and apparent place. The Sun must be nearer the Meridian in his apparent than in his true place; and the higher the Altitudes are, the less will be the error in the Magnetic Amplitude, &c. It is nearly impracticable to find the variation of the compass by the Amplitude, the Horizon being very uncertainly defined both morning and evening, which prevents the possibility of marking accurately the very instant the Sun's lower limb touches the Horizon; therefore it would be advisable to find it whenever an opportunity offers during the day, as it is scarcely possible to be incorrect when the Sun is unclouded.

The Tables of the true Amplitude and Semidiurnal arches, computed to the declinations of the heavenly bodies, and the Latitude of places, do not in any way agree with their Apparent Amplitude or rising, even admitting no variation; for the Apparent Altitude of the Sun's lower limb ought to be 17′ before his true Amplitude or rising should be taken, at which time his centre truly touches the Horizon.

In order to rectify this error, and take the true Magnetic Amplitude or Azimuth, and thence find the correct variation of the Magnetic Needle, I would recommend the following rule:

Rule.—Find the Magnetic Amplitude or Azimuth as before directed, then when the Sun's true Altitude measures equal to that of his Apparent Altitude, (at the time of taking the Magnetic bearing,) find his true Azimuth. Their sum or difference will be the variation of the compass either East or West. But although the variation is of great use in correcting the course steered by the compass, exactness is not requisite, for even should the variation be ever so accurately ascertained, many unforseen circumstances may occur, to prevent the Mariner making due allowance for the course he intends to run; however, he may rely on the Magnetic Amplitude or Azimuth, found as before.

The true Amplitudes are given in Table 8, under the declination, and opposite the Latitude of the place of observation.

THE DISCOVERY OF THE MARINER'S COMPASS.

When the science of Navigation was in its infancy, the want of this important and wonderful instrument, curbed the spirit of the enterprising Mariner, and prevented him trusting his frail bark to the mercy of the open seas, consequently half the habitable globe was kept in ignorance respecting the other. At that period, the only method by which Navigators steered their vessels through the trackless ocean, was, at night, by the Polar Star, when turning their face towards it, they were able to ascertain the East and West points of the heavens. During the day they used the Sun for the same purpose, but fearful that cloudy weather might conceal the object on which they depended for guidance, they confined their course within sight of shore. We are indebted to a shepherd named Magnus for the discovery of the loadstone, wh found a piece sticking to the iron of his sandal, though its amazin properties were not known until about the end of the twelfth centur when John de Gioja noticed the peculiar attraction of metals, and moı particularly of iron, towards masses of ore, the touch of which commu nicated the property of attraction; and that when suspended in equi librium, it invariably turned towards the same points. These an several other experiments, led at length to a trial of the magnetic influ ence on the surface of the water, and the results deduced therefron continued with subsequent observation, have rendered it of such essen tial service and importance in the science of Navigation. On compar ing the Magnetic bearings with the bearings of the Heavenly bodie found by calculation, they were observed to be erroneous, and the di ference between them is called the variation of the Magnetic Needle Compass.

Many theories have been started respecting the attracting pow of this wonderful phenomenon, but the difficulty is rather increase than otherwise, by the acknowledged fact of the Magnet not alwa pointing due North, constantly changing on the coast of England an Ireland about 11 miles annually, and in other places more or les according to their respective situations. A strict attention to th variation is of the utmost importance to the Mariner, there being bı little doubt, that for want of an accurate knowledge of it, many vesse have been lost.

Having the true and Magnetic Amplitude and Azimuth given, fin the variation of the Magnetic Needle.

To ascertain whether the variation be East or West, observe tl following rule:

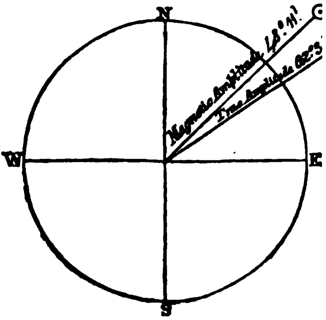
RULE.—Turn your face to the Sun, then if you find the true Ampl tude or Azimuth on the right hand of the Magnetic Needle, the vari tion is East, but if on the left it is West.

EXAMPLE.—Suppose the true Amplitude of the Sun at his risin be 62° 34′ from N. to E., and the Magnetic Amplitude is found to l 48° 11′ from N. to E.

Construction and Demonstration.

Describe the circle and quarter it. Lay off the Magnetic Amplitu from the North to the East; then lay off the true Amplitude in the san direction, and you will find the true Amplitude is to the right of tl Magnetic, therefore their difference is the variation Easterly, thus:

	62°	34′	from N. to E.
	48	11	Do.
Variation	14	23	Easterly.



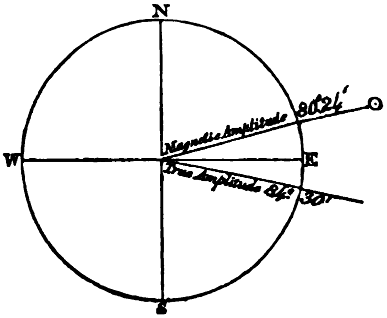
Had the Magnetic been 62° 34′, and the true Amplitude 48° 11′, the variation would have been 14° 23′ Westerly, and the true Amplitude would have been to the left of the Magnetic.

Suppose the Sun's Magnetic Amplitude from N. to E. be 80° 24′, and the true Amplitude from S. to E. be 84° 30′, I demand the variation of the Compass.

Demonstration and Construction.

Describe the circle as before, and lay off the Magnetic Amplitude from N. to E., and the true Amplitude from S. to E., their sum taken from 180° will give the variation of the Needle. Thus :

80°	24′	
84	30	
164	54	
180	00	
15	6	Easterly, for the true Amplitude is to the right of the East.



The same may be applied to the Azimuth; and all cases on this subject may be worked in the same manner.

THE TRUE TIME AT SEA.

I will now proceed to shew in what manner the true time at Sea is to be obtained. Some writers give various methods for that purpose, but they tend more to swell their works than to benefit the Mariner.

The method of finding it by equal Altitudes of the Sun, is as follows :—Take an Altitude at A.M., then watch the Sun until he measures the same height at P.M., by which the true time may be found. But should you fail in finding it at the required instant, your preparation at A.M. is of no use. This is frequently the case, therefore the Mariner must not depend on this kind of observation, but find his true time whenever an opportunity offers. Again, as the refraction is uncertain at the horizon, it is better to avoid finding it when the Altitude is under 10°, as well as when it is within the same limits of the Meridian, for Altitudes taken within a few degrees of it, change but very slowly to what they do at low Latitudes. The change they make in the same length of time when near the Meridian, is hardly perceptible on any instrument, therefore the following problem should be carefully observed, as it will serve to illustrate the above remarks.

I require you to find the true Altitude of the Sun's centre, at six hours from the Meridian, and at 5 hours 40 minutes from it, in Latitude 51° 32′ N., the declination being 5° 20′ N.

Hour from Noon	6h.		Log. rising	5.00000	5h. 40′ Log. rising	4.960
Latitude -	51°	32 N.	Cosine	9.79383	Do.	9.793
Declination	5	20 N.	Cosine	9.99812	Do.	9.978
Diff. -	46	12 NCS.	61940 NN.	4.79195	54000 NN.	4.732
True Lat.	4	10	69214		69214	
	8	45				
			7274		N. S. 15214	
Differing	4	35 or change in 20 minutes				
					True Alt. 8° 45′	

I now require you to find its change within 20 minutes of t Meridian.

	0h. 20m.		Log. rising	2.58039
Latitude	51	32	Cosine	9.79383
Declination	5	20	Cosine	9.99812
	46	12 NCS.	235 NN.	2.37234
			69234	
			68999 NS. 43° 38′ True Altitud	

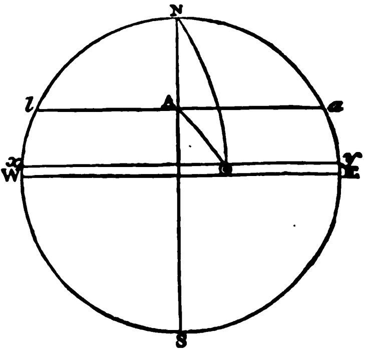
The Meridian Altitude is 43° 48′, and the Altitude within 20 minu of it, is 43° 38′, therefore from 43° 48′ take 43° 38′, and the differe will be 0° 10′, which the Sun has to rise during 20 minutes.

From this calculation you will see how rapidly he rises at low A tudes, in comparison with his slow progress near the Meridian, the fore, before you could observe any change in the Altitude within 5° the Meridian, too much time would be lost. Mariners ought to particularly careful in what manner they take their true time, as it satisfactorily proved, that the higher the Latitude the slower the A tude rises near the Meridian.

Some may think it best to correct the watch or time-keeper by Meridian Altitude, and perhaps in clear weather defer doing so, u that period, to save the trouble of calculation, thinking that the hou 12 can be easily marked by the Meridian Altitude; but those who accustomed to make observations, find that they cannot see m difference for a considerable time in the Sun's Altitude when on Meridian, and consequently that it is impossible to mark the hou 12 accurately. The errors which creep into the Longitude from time at ship being wrong, are explained in the double Altitudes.

In the preceding problem there are three different things laid do viz. the Latitude, Altitude and Declination, which three form three sides of a spherical triangle, which may be solved by dif ent methods, but as it is better to pursue one plan than be c fused by numbers, I recommend the following, which is somew similar to that of finding the Azimuth, Lunar Latitude, Twilight, other problems in Nautical Astronomy; therefore a knowledge o will be useful on various occasions, and avoid the necessity of burd ing the memory with a number of rules.

Construction and Demonstration of the Hour Angle.



Construct the circle to represent the Earth, and quarter it NSEW, and let EW be the Equator, NS the Meridian, *xy* the parallel of declination, (North,) *la* that of the Latitude, and A the ship or observer's place. Let the Sun at A.M. be observed at ⊙, then the Zenith distance at that time will be A⊙, the Polar distance N⊙, and the Co-latitude NA, which forms the spherical triangle AN . The hour angle will be the angle AN⊙, which is always opposite the Co-altitude A⊙.

The same may be observed if the Latitude and Declination differ, that is one N. the other S., then observe the following formula:

Let N⊙=h, NA=H, and A⊙=d, then the versed sine of AN⊙, will be

$$\frac{\text{sine }\frac{d+H+h}{2}-h}{\text{sine h.}}\quad\frac{\text{sine }\frac{d+h+H}{2}-H}{\text{sine H.}}\times 2$$

In words:—From half the sum of the Co-latitude, Co-altitude, and Polar distance, take the Co-altitude and Polar distance separately, then to the Co-secants of the Co-latitude and Polar distance, rejecting tens from their Index add the Log. sines of the two remainders, more the Log. of 2, their sum, rejecting 15 from the Index, will give the Log. V.S. of the true time from Noon.

NOTE—Let the Apparent Altitude and the Declination be corrected as before.

EXAMPLE.—Suppose a ship at sea, 21st June, 1823, at 4h. 33m. apparent time per watch A.M., finds the Altitude of the Sun's lower limb 30° 30′, in Latitude 51° 32′, and Longitude 10° 00′ E., the height of the eye being 20 feet above the sea. Required the true time of observation. By the table that day, the declination of the Sun at the Meridian of Greenwich, was 23° 28′ N., and admits of no correction worth notice. The true Altitude of the Sun's centre is 30° 40′ by Table 24.

By the usual method.

Co-altitude	59°	20′		
Co-latitude	38	28	Co-secant	0.20617
Pl. Dist. -	66	32	Co-secant	0.03749
	164	20		0.30103
	82	10		
	43	42	Sine -	9.83940
	15	38	Sine -	9.43053
Hour angle	4h. 38m. 40s.		VS.	4.81462

Example II.—Suppose a ship at sea the 8th May, 1833, in La tude 39° 36′ N., and Longitude 35° 30′ W., at 5h. 30′ 32″, appar time per watch P.M., the Altitude of the Sun's lower limb was 15° 4 the eye being 18 feet above the level of the sea, and the declination the Sun that day was found to be 17° 6′ at the Meridian of Greenwi by Table 32. The true time of observation is required. The t Altitude of the Sun's centre will be found 15° 53′ 41″, and declinati at ship 17° 10′ 57″ N, by Table 15.

Then let N.A.=Co-latitude	50° 6′ 00″ N.	Co-secant	0.11511
N.G.=Polar Dist.	72 49 3	Co-secant	0.01983
N.⊙=Co-altitude	74 6 19		0.30103
	197 1 22		
	98 30 41		
1st Remainder	48 24 41	Sine	9.87386
2nd Remainder	26 41 38	Sine	9.63703
	True Time 5h. 34m. 31s.	V.S.	4.94686

TO FIND THE TRUE TIME AGREEABLE TO THE TR FIGURE OF THE EARTH.

This problem for finding the true time at ship, requires the great accuracy, in order to shew the difference of time between that Me dian and the Meridian of Greenwich, as found by Lunar Distance the Nautical Almanac. It is evident any errors in the time at sh will make the Longitude wrong at the rate of 15 miles to every min of time, therefore to avoid such errors, observe the following remar

At the time of taking an Altitude, observe the Azimuth of the obj by an Azimuth compass rectified for the variation, otherwise find it calculation. Then correct that Altitude by the Latitude and Azim from Table 31; find also the Geocentric Latitude, and proceed follows:—

Example I.—(*See page* 30.)

Latitude	51° 32′	Altitude	30° 40′
Correction	11		00 to Lat. 52° and Azi. 90°* by Table
Geo. Lat.	51 21	True Alt.	30 40 according to the figure of the Eart

Co-altitude	59° 20′		
Co-latitude	38 39	Co-secant	0.20442
P. Dist. -	66 32	Co-secant	0.03749

---

* As the Azimuths are neither given nor observed in the usual method, nor in two foregoing propositions, they may be found as above by page 24.

	164 31			
				0.30103
	82 15½			
	15 43½	Sine	-	9.43301
	43 36½	Sine	-	9.83867
True Time	4h. 38′ 40″	V.S.		4.81462
True Time	4 38 40	from page 30		
Difference	0 00 0	agreeing with the former.		

EXAMPLE II.—(*See page* 31.)

Latitude	39° 54′	Altitude	15° 54′		
Correction	11	Do.	1		
	39 43		15 55		
Co-latitude	50 17	Co-secant		-	0.11395
Co-altitude	74 5				
P. Dist.	72 49	Co-secant		-	0.01933
	197 11				0.30103
	98 35½				
	25 46½	Sine		-	9.63839
	48 18½	Sine		-	9.87361
True Time	5h. 33m. 32s.	V.S.			4.94681
Time from Pa. 31	5 33 33				
Diff. from the truth	1	equal to nearly ¼ mile of [error in Longitude.			

Though the 1st Problems agree, we find this to differ 1″ from the truth, and in several cases the variation will be greater, making a difference of time to 3 or 4 miles in Longitude.

REMARKS.—In the foregoing example the declination is corrected according to the time per watch and the Longitude; and although the greatest daily variation of the declination is about 1 mile an hour, it would not make much difference if the time per watch and the Longitude were wrong. But were you at a loss to ascertain the time at ship, within an hour of the truth, you cannot properly correct the declination, especially about March and September, in that case it must be corrected by the Longitude, then with that, the Latitude and the true Altitude of the Sun's centre, find the time at ship, with which time correct the declination and proceed as before.

EXAMPLE.—Admit a ship at sea in March, and in Geocentric Latitude 20° 10′ N., and in Longitude 30° 00′ W. Some time at P.M. the apparent Altitude of the Sun's lower limb was found to be 20° 18′, the height of the eye above the surface of the sea was 16 feet.

Required the true time of observation. By the tables that day, Sun's declination was 0° 45′ S. at the Meridian of Greenwich.

Dec. at the Meridian of Greenwich	0° 45′ S.	
Variation to 30° of W. Longitude	0 2 N.	
	43+90=90° 43′ Polar Di	
True Altitude of the Sun's centre	- - 20° 31′	

Then

Co-altitude -	69°	29′		
Polar Distance -	90	43	Co-sect - -	0.000
Co-latitude -	69	50	Co-sect - -	0.027
	230	2		
				0.301
	115	1		
1st Remainder -	45	11	Sine - - -	9.850
2nd Remainder -	24	18	Sine - - -	9.614

True time 4° 31′ 9″ V.S. 4.793

By this you find the Altitude was taken about 4h 31′ 9″ P.M., t fore you must correct the declination to this time, which gives ab miles, consequently the true declination at that time at ship, is 0°

EXAMPLE II.—

Co-altitude -	69°	29′		
Polar Distance -	90	39	Cosect -	0.00003
	69	50	Co-sect -	0.02478
	229	58		0.30103
	114	59		
1st Remainder -	45	9	Sine -	9.85062
2nd Remainder -	24	20	Sine -	9.61494

True time 4h 31′ 15″ V. S. 4.79140

The true time may be found by the Stars as well as by the Su the following rule :

RULE.—Find the Star's Horary Angle or distance West fror Meridian, and Right Ascension, to which add the complement o Sun's Right Ascension; their sum, rejecting 24 or 48, if required be the true approximated time, from which a proportional part o Sun's Right Ascension to the time at Greenwich must be subtra which leaves the true apparent time.

PROBLEM 1.—Admit a ship at sea April 15, 1833, in Lat 48° 56′ N., and Longitude 35° 53′ E., finds the Observed Altitu the Star δ Geminorum west of the Meridian to be 22° 24½′, the hei the eye above the sea 21 feet. Required the true apparent ti observation at the ship.

Star's Observed Altitude -	22° 24′ 30″		
Correction for - - -	0 6 40		
True Altitude	22 17 50		
P· Dist. - -	73 27 55	Co-sect -	0.01834
Co-latitude - -	41 4 00	Co-sect -	0.18248
Co-altitude - -	67 42 10		
	182 14 5		0.30103
	91 7 2		
	50 3 2	Sine - -	9.88457
	17 39 7	Sine - -	9.48173
Hour Angle - -	4h 57′ 17″	V.S.	4.86815
Compt. ☉'s R. A. -	22 26 22		
Star's R. A. - -	7 9 58		
True Apparent time -	10 33 37		

Find the daily difference of the Sun's R. A. = 3′ 41″, a proportional part will be 1′ 52″, which, taken from 10° 33′ 37″, gives 10° 31′ 45″ true time.

Problem 2.—Admit on the 8th of September, 1833, a ship at sea in Latitude 7° 45′ S., and Longitude 3° 36′ E., the Observed Altitude of the Star Procyon east of the Meridian was found to be 28° 16′, the height of the eye above the horizon 18 feet. Required the true apparent time at ship.

Star's Observed Altitude -	28° 16		
Correction - - -	5 50		
Star's true Altitude - -	28 10 10		
Z. Dist.	61° 49′ 50″		
P. Dist.	25 38 50	Co-sec.	0.00211
Co lat.	82 15 00	Co-sec.	0.00398
	239 43 40		0.30103
	119 51 50	Sine	9.78557
	37 36 50	Sine	
	24 13 00	Sine	9.61298
Hour Angle	4h 2′ 33″	V.S.	4.76564
*'s D.W. of Mer.	19 57 27		
*'s R. A. -	2 30 34		
Com. of ☉ R.A.	12 53 13		
True Time -	11 21 14		

To the time at Greenwich and daily variation of the Sun's R. A. 3′ 36″, give 2′ 9″ for P. P. to be taken from 11° 21′ 14″, which gives 9° 17′ 53″ for the true apparent time of observation.

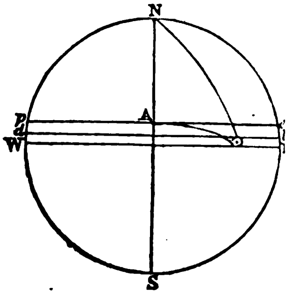
Note.—Though in the above two Problems the true figure of the Earth is not considered, yet for accuracy the Altitudes should be corrected, as in other Problems in the Work.

CASE I.

The Latitude of the place of Observation, the Declination of any the Heavenly Bodies, and the apparent time from Noon given to find their true Altitudes.

The following figure will shew the nature and construction of th Problem.

Demonstration and Construction.



Describe a circle as before, let WE represent the Equator, *dl* the parallel of declination, *pe* the parallel of latitude, and A the place of observation. Let the angle AN⊙ be equal to the hour from noon, when the Altitude is required. AN the complement of the Latitude, N⊙ the Polar distance, and the angle AN⊙ will be given to find the side AN, which is the Zenith distance, or the complement of the Altitude required.

Let NA be=h, N⊙=H, and the <AN⊙=z and A⊙=d, then t formula will be cos. d=cos. (h—H)—cos. h. cos. H VS<z.

In words, to the log V.S. of the apparent time from noon, add t log cos. of the latitude, and that of the declination, their sum, rejecti 20 from the index, will be the log of a N.N. to be taken from the N. of the Meridian Altitude,* the remainder will be the N.S. of the tr Altitude.

EXAMPLE †—In Latitude 2° 10′ N., when the Sun's declination 1° 3′ N., what will be the Sun's true Altitude at 4h 50′ and at 5h 3 both P.M.

P.M.	5h 30′	Log-rising	4.93925	P.M.	4h 50		Log-rising	4.844
Lat.	2 10N.	Cosine	9.99969	Lat.	2 10N.		Co-sine	9.999
Decli.	1 3N.	Co-sine	9.99993	Decli.	1 3N.		Co-sine	9.999
Co-la.	87 50	N.N.	4.93887			69870=	N.N.	4.844
		86870						
M.alt	88 53	NS.99981	Mer. Alt. 88° 53′			N.S.	99981	
T.alt.	7 32	NS.13111	True Alt. 17° 31′ 28″			N.S.	30111	

It is to be observed in all calculations, that the Sun's declinati must be reduced to the time and meridian of the place of observation

The following method is that which is used among Lunarians wh there is not a sufficient number of observers to take the requis observations. One takes the distance, and another an altitude of o of the objects, and finds the true Altitude of the other by calculati If therefore, from the figure of the Earth, the Latitudes are not ge centric, the Altitude usually found must be incorrect, and the nea to the Meridian the observations are made, the greater will be the err For Example :—

---

* If the ship's co-latitude and the Sun's declination be both north or both sou their sum will be the Sun's Meridian Altitude; but if one be north and the other sou their difference will be it.

† Problem 2, page 13, is taken from this Example.

Problem II., page 29.

Admit the Latitude 51° 32′ is not geocentric, require the Altitude there.

Lat. - -	51 32			
	11			
Geocentric Lat.	51 21		Co-sine	9.79558
Declination -	5 20		Co-sine	9.99812
	0·20		Log-rising	2.58039
			237 N.N.	2.37409
	46 1	N.S. 69445		
		69708	N.S.	43° 47′ true alt.
Altitude from page 29		- -		43 38
Difference		- - -		9

When the Altitude of a Star is required by calculation, to the apparent time of observation, answering to the Meridian of Greenwich, add the Sun's R. A. at the reduced time, which will give the R. A. at the Meridian, the difference between it and the Stars R. A., will give the Star's distance from the Meridian or Horary Angle, with which the Latitude and Declination find its true Altitude as before.

The Moon is preferred for observation, on account of her quick motion in the heavens, in consequence of which, her Altitude by calculation is liable to some errors; for which reason, I have thought proper to reject the calculation here, but should it be required in any instance, it may be found the same as the Stars.

Besides the error here arising from not finding the Altitude by a Geo-centric Latitude, I will point out another which is so disgracefully overlooked by some of our best writers on this subject. It should be remembered, that those into whose hands such works usually pass, place unbounded confidence on the authors, therefore they cannot be too cautious how they lay down rules, which if not correct, may only mislead the Mariner, and injure that science they wish to benefit.

The following is the usual method practised up to this day.

If the Apparent Altitudes be wanted, the difference between the ☉'s Parallax and Refraction must be added to his true Altitude, the Refraction must be added to the true Altitude of a Star, and the difference between the Moon's Refraction and Parallax in Altitude, must be subtracted from her true Altitude thus found, to obtain the respective Apparent Altitudes of their centres.

For **Example.**—In the first instance, suppose the true Altitude of the Sun was found by the foregoing calculation to be 0° 00′ 00″, require the Apparent Altitude according to the usual rule, it will be as follows:

In the Table opposite 0° 00′ 00″ will be 32′ 51″ for correction, which is equal to the difference between the Parallax and Refraction which added to the true Altitude, according to the second rule, will give the

Apparent Altitude to be 32′ 51″; now it is evident, if the Appar Altitude of any object were corrected for the Refraction and Parall the true Altitude would remain, therefore for 32′ 51″ Apparent Altitu would be correction 27′ 50″, equal to the difference of the Parallax a Refraction of that Altitude, which subtracted from the said Altitu 32′ 51, leaves 5′ for the true Altitude, which is sufficient proof of rule being erroneous, for the rule contradicts the calculation. T Apparent Altitude of the Sun should be about 27° 40′, when his t Altitude is 0° 00′ 00″.

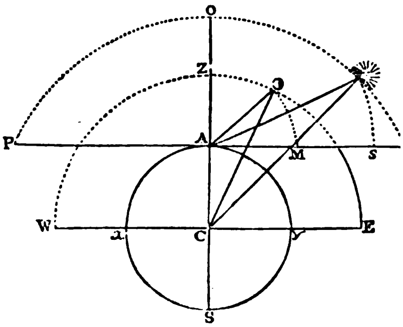
The error of this rule is avoided, by finding the true Altitude Table 24.

To obtain the Longitude at Sea by Lunar Observations.

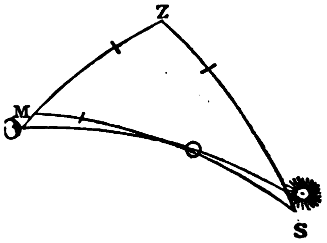
This subject has engaged the attention of some of our most emin philosophers and mechanics, and several plans have been started the solution of this grand difficulty in the science of Navigation, all have proved defective. Great improvements have been made si the encouragement given by Parliament, both in Mathematical Tab and Instruments, and the great accuracy with which the Longitude now be determined, exceeds the most sanguine expectations. Th are two methods in general use for that purpose at present, viz. Lu Observations and Chronometers : the latter are liable to different err from the delicate structure of their works and the change of climate, that the very best of them are found to alter their rate of going, which a daily correction is requisite. In consequence of this var tion, the most approved method is by Lunar Observation, that taking the Apparent Altitude of the Moon, that of the Sun, or o fixed Star, and the apparent Angular Distance between them; the fore, as the observations are made on the surface of the earth, and Apparent Altitudes incorrect, the difficulties to Mariners in this Pr lem, are, in correcting the Altitudes, and reducing that apparent an lar distance taken from the surface of the earth, to what it should m sure at the same time, supposing the Observer had been at the cen of it. This method was proposed some time ago by JOHN WARN but from the want of proper instruments for taking Altitudes, forming correct Mathematical Tables, to ascertain the place of heavenly bodies, it was laid aside. These obstacles are now remov by Hadley's quadrant or sextant, and several Mathematical Tab and the field open for further improvements in the science.

The following figure will shew the nature of the true and appar distances of any two heavenly bodies.

Construction and Demonstration.



Construct the three circles A*x* s*y*, WZE, POG, and let the small circle represent the Earth, the second the Moon, and the third the Sun. Then let the Observer be at A, his horizon PMG, his zenith Z, then let the Apparent Altitude of the Moon be the angle ☽ AM = arc ☽ M, and that of the Sun the angle ☉AS = arc ☉S, then their apparent angular distance will be the < ☽ A ○, and the true or central angular distance will be the < ☽ C ☉ which is required. Several methods have been given by Mathematicians for the solution of this problem, but many of them are rejected as inconvenient and impracticable; and as I consider that the more concise and compendious the calculation, the better will it be adapted to the use of the Mariner, I would recommend the following, which will be of the greatest advantage to him, and supersede the multitude of Tables which are required in other plans. The following figure will shew the grounds on which it is constructed.



Let ☽ Z be the Zenith distance of the Moon's Apparent Altitude, ☉Z that of the Sun's, and ☽ ○ their apparent angular distance, and let the true zenith of the Moon be MZ, and that of the Sun SZ. When in the spherical triangle ☽ Z ○, the three sides are given, with which find the angle at the Zenith = < ☾ Z ○; and again in the spherical triangle MZS, you have the two sides MZ. ☉ Z, and the angle at the Zenith given to find MS, which will be the distance required. The angle at the Zenith and the side MS, are eliminated by following the two general formula.

Let the Apparent Distance of the Moon be - - - H′
That of the Sun - - - - - - - - - h′
The true Altitude of the Moon - - - - - H
That of the Sun - - - - - - - - - h
Their Apparent Angular Distance - - - - d′
Their true or central Distance - - - - - d
And the Angle at the Zenith - - - - - Z

$$\text{V.S.}<Z=\frac{\text{Sine}\ \frac{d'+h'+H'}{2}-H}{\text{co-sine}\ H'},\ \frac{\text{Sine}\ \frac{d'+h'+H'}{2}-h}{\text{co-sine}\ h'}\times 2$$

and cos. d=cos. (h—H)—cos. h. cos. H. V.S. < Z, hence the formula transposed gives

$$\cos d=\cos(h-H)\ \frac{2\cos h-\cos H}{\cos h'-\cos H'}\ \text{sine}\ \frac{d'+h'+H'}{2}-h\ \ \text{sine}\ \frac{d'+h'+H'}{2}-H$$

for a formula for clearing a Lunar Distance free from the effect of Refraction and Parallax.

Preparation for the Lunars.

Find the true and Apparent Altitudes as before directed: then convert the Longitude by account into time, which, either added to or subtracted from the true time at Ship, will give the supposed apparent time at Greenwich. Then from page 7 of the month in the Nautical Almanac, take the Moon's Semi-diameter, which must be reduced to the apparent time at Greenwich, to which add the augmentation of her Semi-diameter as directed in the Use of the Tables; then from page 3 of the month in the Nautical Almanac, take the Sun's diameter and both together, their sum added to or subtracted from Apparent Distance, according as the nearest or most distant limb taken, gives the apparent central distance.

The foregoing Formula in Words.

From half the sum of the apparent distance and apparent altit take each altitude separately; then to the log-sines of both remain add the log luni-solar, answering to the Moon's Apparent Altitude Horizontal Parallax, the sum of these three logs, rejecting tens the Index, will be the log of a natural number to be taken from N.C.S. of the difference of the true Altitude, the remainder will b N.C.S. of the true distance.

NOTE.—When the N.N. answering to the sum of the three logs tioned before, is greater than the N.C.S. of the difference of the Altitude, the true distance is more than 90°, in which case the of the last remainder is to be added to 90° for the true distance.

CASE 1.

Having given the true and apparent Altitudes of the Moon, Su any of the principal Stars, with their apparent distance, to fin true distance.

EXAMPLE 2.—*(See Moore's Navigation, 10th edition, pages and 251).* Given the Apparent Altitude of the ⊙'s centre 32°, t the ☽'s 24°, and the apparent distance of their centres 68° 42′ 11′ the ☽'s horizontal parallax 58′ 10″. Required the true distance. the preceding formula, it will be

⊙ Apparent Altitude	32°	00′	00″			
☽ Apparent Altitude	24	00	00			
Apparent Distance -	68	42	11			
	124	42	11			
	62	21	5		Luni-solar Log	0.2
	38	21	5		Sine - -	9.7
	30	21	5		Sine - -	9.7
True Alts. ⊙	31	58	37		923010 N.N.	9.7
True Alts. ☽	24	51	1			
x	7	7	36	N.C.S.	992273	
					369263	N.C.S 68° [true dis

I will only introduce another Problem, where the distance w more than 90°.

EXAMPLE 3, *in the same Work, pages* 245 *and* 252. Given th ⊙'s apparent altitude 18° 59¼′, the ☽'s 70° 44′, the apparent distan of their centres 103° 30′ 8″, and the ☽'s horizontal parallax 59′ 15 Required the true distance? though Mr. Lyon, and Mr. Witche Teacher of the Naval Academy at Portsmouth, agree in their solutio of this problem, both giving the true distance 103° 0′ 16″, I he observe, that according to 20th 12 Euclid, it is impossible and absur that one leg of a spherical triangle should be greater than the oth two.

On the above problem and its solutions, I will offer no further com ment, but leave it to the judgment of the Mariner, and men of scienc

EXAMPLE 4. (*page* 256 *of the said Work.*)

Given the Sun's Apparent Altitude 45° 32′ 40″, and the Moo 19° 43′ 23″, the Moon's Horizontal Parallax at the reduced ti 55° 58′, and the apparent central distance 106° 46′ 23″.

Apparent Distance	106°	46′	23″		
⊙ Apparent Altitude	45	32	40		
☽ Apparent Altitude	19	43	23		
	172	2	46		
	86	1	23		
				Luni-solar Log	0.298
	66	18	00	Sine -	9.961
	40	28	43	Sine -	9.812
True Alts. ⊙	45	31	51	118274 N.N.	0.072
True Alts. ☽	20	33	27		
x	24	58	24	N.C.S.	.90650
				.27624 N.S.	16° 2′ 1
				+	90 0 0
				True Distance	106 2 1

REMARK.—

When the N. N. of the sum of the three Logs, is more than th N.C.S. of the difference of the true Altitudes, the true distance wi exceed 90°, and the N.S. of the difference will give what the true di tance is above 90°. In such cases as the above, Dr. Brinkley thoug it better to take the versed sine of the above difference for the tr distance, as it might be taken to 180 in the Tables; to this I objec The versed sine of the above, is its complement to 100000, but whil you are observing it, you have the N.S. taken, which added to 90° f the true distance, besides giving you the trouble of finding the V.S obliges you to make use of another Table; therefore, I consid Brinkley's remark is no improvement to it. This method of finding th

Longitude being so easy and concise, I do not think it necessary t give any exercises on the subject, as the two foregoing will answer i all cases which may be required at sea. They may be dated to an given year, for which year a Nautical Almanac is essential.

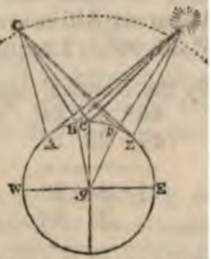
The two preceding Problems will be sufficient to shew the use an practice of this approved method for clearing a Lunar distance fro the effect of Refraction and Parallax.

As the above system may appear strange from its novelty, I hav thought it best to apply it to propositions already in the hands of th public, where both systems are used, admitting the globe to be perfect sphere, by which, in some cases, there will arise an error o about 22 seconds; to avoid which, observe the following instructions.

1st.—In Table 34, find the reduction of the Moon's Horizonta Parallax answering to the latitude of the ship, which must be take from the Horizontal Parallax found in the Nautical Almanac; wit which, and the Moon's Observed Altitude, find her true Altitude b Table 23; find likewise the Sun's True and Apparent Altitudes b Table 24; then with the Moon's Azimuth at the time of observation correct her Altitude by Table 31; do the same with the Sun; the find their central apparent distance by Table 28, and proceed as before, which will give the true central distance cleared from the effect c Refraction and Parallax, according to the true figure of the earth, b which the true time at Greenwich by the Nautical Almanac will b found to the nearest degree of exactness.

Having cleared the true Lunar distance, I think it will be desirabl and satisfactory to the Mariner, to shew the nature and construction c the true distance in the Nautical Almanac, and how the time at Greenwich may be obtained by any number of observers, when, althoug each observer may be in a different part of the world, it will be proved that though differing in their observations, the result of their calculations will be the same.

The Distance in the Nautical Almanac explained.



Admit any number of observers at the same time to view the Sun and Moon, or Stars, and take the Apparent Altitudes and angular distance, such as ABCDE, then the angular distance with A, will be ☽A○, with B, ☽B○, with C, ☽C☉, with D, ☽D☼, and with E, ☽E☉, then when each clears his apparent distance from the effect of Parallax and Refraction, he will have the central or true distance = ☽ g ☉* which is that in the Nautical Almanac, given for every three hours answering to the Meridian of Greenwich, then it is obvious, that if al looked into the Nautical Almanac with this central distance, the would have the same time at Greenwich. Then as the timekeeper change 1 hour of time every 15° of Longitude, those who are 15° of Eas Longitude, will have 1 P.M., and those 15° West Longitude, wil have 11 A.M. when it is 12 at the Meridian of Greenwich. There fore, find the true time at the Meridian of observation, and compare i to the time at Greenwich found by the Nautical Almanac; and if the time at ship be more than that of Greenwich, you are to the east of the Meridian, if less, you are to the west, then the difference of these two times, converted into degrees, will give the difference of Longitude between the ship and the Meridian of Greenwich.

---

* The communication between the centre and the two objects, should have bee perfectly straight, crossing the horizon at the points B and D.

The Longitude may be found by the Moon and a Planet, as well as by any other two bodies, allowing for the Horizontal Parallax of the Planet; but by the Sun and a Planet it is impracticable, as the latter are seldom seen with the Sun, and when visible, their light is too faint for any observation to be made correctly, as we have noticed before in the Latitude.

RULE.—

In page xii., xiii., xiv., xv. of the month in the Nautical Almanac for the year 1833, look for the correct distance on the given day, if you find it among the distances, the time at Greenwich will be at the top of the column; but as it generally falls between two columns, find proportional parts for it by the difference in 3 hours, which is the difference between each column; and add it to the time placed over the first distance, which will give the true time at Greenwich, or it may be done more correctly by the P. Logarithms, thus:—

Take the difference between the computed distance, and the next before it in the Nautical Almanac, and the difference between the next before and after it, which will be the difference in the 3 hours; then to the P. Log. of the difference in 3 hours, add the P. Log. of the difference between the computed distance and the next before it, the difference of these two Logs. will be the P. Log of a proportional part of time, to be added to the time standing over the first distance found in the Nautical Almanac for the true time at Greenwich, then the difference of time between the ship and Greenwich converted into degrees will give the true Longitude of the place of observation required.

CASE .—The true distance and time at ship being given, to find the true Longitude. Suppose, on the 31st of May, , the true distance between the Sun and Moon was found to be 68° 19′ 46″, the Apparent Altitude of the Moon 32° 00′ 00″, and the true time at ship 5° 36′ 00″. I require the true Longitude.

By the Nautical Almanac in that year, May 31st, at 3h 00′ 00″ distance is 68° 57′ 44″ and at 6h 00′ 00″ it was

67 23 15		Computed distance	68° 19′ 46
		At 3h at Greenwich	68 57 44
1 34 29	P. L. 0.2799		
37 58	P. L. 0.6759		37 58
1 12 19	P. L. 0.3960		
3			
4 12 19 true time at Greenwich			
5 36 00 time at Ship			
Diff. 1 23 41=20° 55′ 15″ true Longitude			

See Example 1st, page 39.

The true distance between the Sun and Moon being given on the 13th of June, in the year , at 3h 17′ 20″ P.M., find the true Longitude.

	° ′ ″		° ′ ″
Dist at 6h being the next =	105 58 3	True dist.	106 2 16
at 9h the next Col. =	107 24 54	Dist at 6h	105 58 3
			4.13 P.L. 1.6303
	1 26 51		P.L. 0.3165
	h ′ ″		
	8 4	of P. Log.	1.3138
Time at 1st Dist.	6° 00′ 00″		
	6 8 44	True time at Greenwich.	
	3 17 20	Time at Ship.	
Difference -	2 51 24	= 42° 51′ Longitude in W.	

See Example 2nd, page 40.

The True Longitude by a Chronometer or Timekeeper.

If a good timekeeper be set to the meridian of any place, it will keep the time of that meridian for several days, but I have before observed, that the best of them are liable to alter their rate of going in different climates and seasons, especially when their delicate works are becoming old. From these and several other circumstances, they require a daily correction, which is better done whilst the vessel is at rest, as the daily change may be so trifling, that it will be difficult to correct it, Therefore I would recommend the chronometers being corrected after a lapse of seven or eight days, dividing by the same number, its time gained or lost. Its variation must be rectified by the Altitude of the Sun in the following manner: first, set the timekeeper to the true time of the meridian of the place of observation by problem 1st, page 30, and after a few days, again find the true time by the Sun's Altitude Declination, and the Latitude of the place as before; to which apply the equation of time found in the Nautical Almanac, with the contrary sign, which compare with the chronometer, and if it be correct, they will not differ. If incorrect, take their difference and divide it by the number of days which have transpired since you set the chronometer, and the quotient will be the daily variation.

If it be losing, you must multiply the daily loss by the number of days elapsed since you rectified it, the product added to its present time produces the true time or rate of going, but should it be gaining, it must be subtracted. If the ship be making way through the water, which is commonly the case during the time of such observations, it will be impossible to find the daily variation of this delicate piece of mechanism.

Having found the chronometer's rate of going, correct it daily, and the difference between its time and the time at ship corrected by the equation of time found in the Nautical Almanac, and converted into degrees, will give the difference of Longitude; and if the time of the chronometer exceed the time at ship, you are in west Longitude, if less, you are in the east.

Example.—Suppose a chronometer was regulated to the Meridian of any place, and in eight days afterwards you found the mean time at the same Meridian, by an Altitude of the Sun, to be 2h 30′ 20″ P.M., at which period, the time by the chronometer was 2h 30′ 00″, I demand its daily loss or gain.

From time 2h 30′ 20″
2 30 00

20

$$\frac{20}{8} = 2\tfrac{1}{2}$$ the daily loss of the Chronometer.

CASE 1.

Given the rate of a Chronometer, the Latitude of a place, the Sun's Altitude, and the Day of the Month, to find the Longitude of the place of Observation.

Problem 1.

Supposing this chronometer were set to the Meridian of any place, and the ship under weigh for 12 days, then find the true time by the Altitude of the Sun to be 4h 20′ 30″, corrected for the equation of time, and by the chronometer 5h 10′ 20″, I demand the Longitude of the ship: thus, 2½ 12=30″, the whole loss of the chronometer, then—

5h 10′ 20″
30

5 10 50 true time by the chronometer.
4 20 30 true time per watch, or equated time.

50 20 =12° 35 west Longitude.

Suppose the chronometer gained in its rate of going, then—

5h 10′ 20″
30

5 9 50 time per chronometer.
4 20 30 time per watch, or equated time.

49 20 = 12° 27′ 30″ west Longitude.

Because the time per ship is less than that per chronometer, it is obvious that the time at the Meridian from which the ship departed 12 days ago, is given by the chronometer, and that all other places to the west of that Meridian, must be later than it in time; and places to the east of it will be earlier. Therefore, as the time per ship in the above problem, is less than that of the chronometer, the ship is in West Longitude. The above will, I trust, be sufficient to shew the use of the chronometer. Some writers comment more largely on the subject, and introduce a multitude of problems, with the mean of several Altitudes and times, which, instead of assisting the Mariner or Pupil, only burden the memory, and cause endless trouble.

EXPLANATION

AND

USE OF THE TABLES.

TABLES I. AND II.

Called Traverse Tables.

These Tables are the result of plain triangles, extending to 300 mi of the Hypothenuse or distance, being the greatest distance that a sl is supposed to sail in 24 hours. In the First Table, the difference Latitude and Departure is given to every quarter point of the compa and is useful in various sailings, particularly in traverse sailing, making up a day's work. The Second Table contains the differer of Latitude and Departure to every degree, and extends to 300 miles the distance. The difference of Latitude and Departure in these Tabl is given in miles and tenth of miles, to every degree of the cou steered which is found at the top when it does not exceed 4 points 45 degrees, and at the bottom when more than that, the difference Latitude and Departure at the top change their names, when the cou is found at the bottom, that is, the difference of Latitude at the t becomes the Departure, and the Departure becomes the difference Latitude at the bottom. The distance in both cases, remains t same.

CASE 1.

To find the Difference of Latitude and Departure to any Distanc run.

RULE.—Find the distance run in a Distance Column, and t course or degrees steered, either at the top or bottom, directly oppos the distance, will stand the difference of Latitude and Departure.

EXAMPLE.

Suppose a ship sail W.S.W., or 6 points from S. to W. 104 mil what is her difference of Latitude and Departure? In the First Ta in the column of distance, find 104 and 6 points at the bottom, tl opposite 104, you will find difference of Latitude 39 8S., and Dep ture 96. 1W.

The Second Table may be used in the same way; but should distance be more than the extent of the Table, divide it by 2, 3, or a other convenient figure, and take out the difference of Latitude a

Departure for the quotient; then multiply them by the figure by which you before divided, and the product will be the true difference of Latitude and Departure for the whole distance required.

In the Second Table, the given course or angle steered, may be between two degrees or pages, in which case the true difference of Latitude and Departure cannot be correctly found in either; in such instances, take the difference of Latitude and Departure next before and after it, and find their difference; then say as 60 is to the difference of either, what will the odd miles, not found among the degrees, give? which must be added to or subtracted from the next less, according as the Table is increasing or decreasing, for the true difference of Latitude and Departure, answering to such degrees and miles of the course or angle steered.

Example.—Suppose the course steered, corrected for variation and lee-way, was 30° 22′, and the distance run 230 miles, what is the difference of Latitude and Departure?

The Column of Distance opposite 230, and under 30° gives Difference
Lat. 199.2 Dep. 115.0 In the Col. of Dist. opposite 230, and under
Lat. 197.1 Dep. 118.5 [31°, gives Diff.

Diff. 2.1 Diff. 3.5 then as 60 is to 2.1, what will 22′=0.8 which taken from 199.2, for it is decreasing, gives 198.4 for the true Difference of Latitude.

Again, as 6 is to 3.5, what will 22′=1.3? which added to 115.5, for the departure is increasing, gives 116.3 for the true departure; so that the difference of Latitude and Departure answering to 30°.22 and distance 230, are 198.4 and 116.3.

Sometimes the third term of a right-angled triangle is required, then you have only to compare the two that are given to those among the Table, until you will find them to agree, or nearly so, then the third will stand directly opposite in the angle of meeting in that page of the Table.

TABLE III.

Of the Refraction.

This Table contains the Refraction of the Altitudes of the heavenly bodies, as explained in page 4. They are given in minutes and seconds at a mean state of the atmosphere, and must always be subtracted from the Apparent Altitude; for example, the Apparent Altitude 30° 30′, its Refraction 1′ 37″, then 30° 30′—1′·37″=30° 28′ 23″ true Altitude clear of Refraction.

TABLE IV.

Of the Dip of the Horizon.

This Table is explained in page 5, and the depression of the visible below the true horizon, answering to the height of the eye, is given in minutes and seconds, which are always to be subtracted from the Observed Altitude. For Example:—

Suppose the height of the eye 18 feet above the surface of the s the correction or dip is 4′ 4″, so that the visible horizon is so much l low the true horizon. This quantity is to be subtracted from a Altitude taken at that height, to agree with that taken at the surface true horizon at the same time.

TABLE V.

The Sun's Parallax in Altitude.

This Table is demonstrated in page 3, and is given in seconds every 10° of the Sun's Altitude, which must always be added to Apparent Altitude.

TABLE VI.

The Moon's Augmentation.

As objects increase in magnitude to an observer according to t distance, the Moon being further from the observer when on the h zon than when at the Zenith by the Earth's semi-diameter, it is dent her semi-diameter is augmented from the horizon to the Zen Her augmentation in Altitude given to seconds in this Table, must added to her semi-diameter taken from the Nautical Almanac, to her true semi-diameter at any Altitude.

TABLE VII.

The Dip of the Horizon at different distances from the Observe

This Table differs from Table IV., which is computed for an o horizon. It is calculated so that, when the land is between you the Sun, or any other object in taking an Altitude, you must dip heavenly bodies nearer to you than you otherwise would, had you open horizon. In this case, you must guess the distance you are f the land, and enter this Table with the distance found in the left-h column, and the height of the eye at the top in the angle of meetin the Dip, which is to be subtracted from the Apparent Altitude.

TABLE VIII.

Amplitudes.

This Table contains the Amplitude or horizontal Azimuth of heavenly bodies from the east or west, and will on inspection be fo an expeditious method of finding the variation of the compass.

Rule.—Find the Latitude in the left-hand column, and the de nation at the angle of meeting will be the Amplitude; should any minutes be in the declination not found in the Table, proporti parts should be taken, and likewise in the Latitude, should accurac required. The intention of this Table is to correct the compass, w in general, need not be very accurately done, on account of diffe circumstances attending the course steered from lee-way, heav the sea, &c. &c.

EXAMPLE.—In Latitude 52°, the Declination 20, what is the Amplitude?

Opposite 52° in Latitude Column and under 20 Declination, will give 33° 45′ at the angle of meeting, for the true Amplitude.

TABLE IX.

Of the Semi-diurnal and Semi-nocturnal Arches.

By this Table, the time of the rising and setting of the heavenly bodies is found. It is to be used the same way as the Table of Amplitudes. At the angle of meeting you will find the time of the objects setting, when the Latitude and Declination are of the same name, and of its rising when they are of different names. Multiply the time of setting by 2 if the object be the Sun, and it will give the length of the day; likewise multiply the time of its rising by 2 for the length of the night.

EXAMPLE :—

In Latitude 52° N., the declination of the Sun 20° N., what is the length of the day and night?

Opposite 52° and under 20° will be 7h 51′ the Sun's setting.
2

The length of 15 42 the day.
24 00

Complement to 24 gives 8 18 the length of the day.

If there be any odd number either in the Latitude or Declination, which is not found in the Table, proportional parts may be taken, should accuracy be required; but this is not essential in the rising or setting of any of the heavenly bodies, as the important part of this work does not depend on accuracy in this instance.

TABLE X.

Of the Sun's Mean Right Ascension.

This Table contains the Sun's Right Ascension to every day of the year, or the distance he is in the Ecliptic reckoned from the 1st. point of Aries, adapted to the year 1834. It is generally useful in finding the time the heavenly bodies pass the meridian, their rising or setting. It is given in hours or minutes.

To find the time of any Star's passing the Meridian.

RULE.—Subtract the Sun's R. A. at noon from the Star's R. A. in time, increasing it by 24 if required, the remainder is the time of the Star's passing the Meridian, from which a proportional part of the daily increase of the Sun's R. A. for this apparent time from noon being subtracted, will give the true time of the Stars passing the Meridian. Then, with the Star's declination and the Latitude of the place, enter Table IX., and at the angle of meeting you will find the time the Star takes in ascending from the horizon to the Meridian, and descending from the Meridian to the horizon; that is, when the declination and

Latitude are of the same name ; consequently, the difference b
these hours and minutes, and the time it passes the M
will be the time of its rising, which, if added, will give the tim
setting. When the Latitude and Declination are of contrary
the time found by the Latitude and Declination in Table IX.
angle of meeting, will be half the time the Star continues und
Meridian; therefore, if it be taken from 12 hours, it will give h
time it will be above the horizon, with which, and the time of i
sing the Meridian of observation, continue as above for its risi
setting.

Example.—What time will the Star Regulus rise and set
the 1st, 1833, in Latitude 52° N. ?

	h	′	″	
Regulus's R. A. -	9	58	47	
Sun's R. A. 1st Aug. 1833	8	45	25	
In Table IX, true answer to Lat.	1	13	22	
52° N., & 12° 50′N. the Star's Dec.	7	9		
The time of the Star's rising -	5	56		
	8	22		time of the Star's sett

Remark.—This will be found explained in some of our
works on Navigation, thus : take the time of the Star's ascen
descending from the Meridian to the horizon, from the time of i
sing the Meridian, the remainder will be the time of its rising,
added, will give its setting. In the following problem, the tim
Star's ascending or descending is greater than the time of its
over the Meridian, therefore it cannot be subtracted from the
its passing the Meridian, consequently, such a rule cannot be
ral, and can only be applied where the time of the Star's pa
greater than that of its ascending from or descending to the Me

Example.—At what time will the Star Altair rise and set
1833, in Latitude 45 N. ?

	h	′	
Altair R. A. - - -	19	42	
The Sun's R. A. May 8, 1833	3	00	
Time of Altair pass. the Mer.	16	42	
Time answering to Lat. 45 N., and Altair Dec. 8° 24′ in Table IX.	6	33	
Time of Altair rising -	10	9	P.M.
Time of his setting -	13	15	or 1h 15 A. M.

The rising and setting of the Planets may be found in th
manner, except of the Moon on account of her irregul
quick change of declination, &c. ; but to remedy this, her dec
at the approximated time of her rising and setting must be foun

which again enter the Table of Semi-diurnal Arches and the Latitude, and proceed as before.

Note.—It is unnecessary to give an Example to the above remark, as reference may be made to the Nautical Almanac of the year for her declination on the given day, when her time of passing the Meridian of Greenwich may be found, and likewise the time of her rising and setting; after which, you have only to find her time of passing the Meridian of the place of observation by Table II.

It will be useful to know the time the Stars and Planets come to the Meridian of the place of observation, in order that the observer may prepare to take the Meridian Altitudes, to find the Latitude of the place of observation.

TABLE XI.

To reduce the time of the Moon's passing over the Meridian of Greenwich, to the time of her Passage over the Meridian of any other place.

Rule.—The daily variation of the Moon's passing the Meridian is found at the top, and the Longitude in the left-hand column; at the angle of meeting will be the correction, which, if the Longitude be West must be added, and if East must be subtracted.

Example.—At what time will the Moon pass the Meridian of a place of observation, in Longitude 88° 00 East of Greenwich on the 20th of October, 1833?

	h	′
By the Nautical Almanac, the Moon passes the Mer. of Greenwich	6	30
Daily Var. in passing the Mer. 0h 51′, and Longitude 88° -		11
Time of passing the Mer. of the place of observation - -	6	19

TABLE XII.

To Correct the Mean Refraction.

The Mean Refraction is given for the mean state of the atmosphere, that is, when the thermometer stands at 50°, and the barometer at 29.6 inches, but the refraction varying with the atmosphere, corrections are required to the mean refraction, particularly in low altitudes. In this Table, the height of the thermometer is given at the top; the Apparent Altitude in the left-hand column; and at the bottom will be the height of the barometer in inches and tenth of inches. You must enter the Table with the Apparent Altitude, and the height of the thermometer or barometer, and at the angle of meeting will be a correction to be applied to the Mean Refraction.

Example.—Suppose the Apparent Altitude 8°, the height of the thermometer 64°, and that of the barometer 30.1. Required the true Refraction?

Mean Refraction for 8° of Altitude - - - - 6
Corr. for 8° of Altitude, and 64° height of thermometer - 13″ }
Again 8° of Altitude, 30·1 height of barometer - - — 6 }

True Refraction required - - 6

TABLE XIII.

For Reducing Longitude into Time, and the Contrary.

This Table contains the change of time in any given Longitude Ea or West, as 360° of the Equator revolves round in 24 hours, or to more distinctly understood, every point on the Equator describes circle of 360° in 24 hours, therefore 15° is traversed in one ho which will be shewn by the Table, which is very simple, a needs no example to further illustrate it. Find the degrees, &c. their column against which stand the hours, &c. and visa versa.

TABLE XIV.

For finding the Distance of Terrestrial Objects at Sea.

This Table is computed by the 36th of 3rd Euclid, allowing for t terrestrial refraction, and is generally useful in ascertaining the distan an observer can see on the surface of the sea, by having the height the eye above the horizon given. For Example:—Suppose the heig of the eye above the sea is 20 feet, I demand the distance an observ can see? Enter the Table with the height 20, and directly opposite stands 5 miles, and 14 of a hundred, in the column marked distance the top.

Likewise, when a ship is approaching land, and sees a light-hou or any other object whose height is known, take the height of the ey and the distance answering to the elevation of the light-house; ad both together, and their sum will be the distance required.

TABLE XV.

For Reducing the Sun's Declination to any given Meridian, and to any time under that Meridian.

Find the nearest degree and minute of the declination at the top, th Longitude in the left-hand column, and the apparent time of observa tion on the right-hand, then with a double entry take out the correctio answering to the declination and Longitude, and likewise that answe ing to the declination and apparent time. The sum or differenc according to the title at the top of the Table, will be the correction t be applied to the declination.

Example 1st.—Suppose on the 26th of May, 1833, the Sun declination in Longitude 24° West was required?

Sun's declination 26th of May by N. A. 21° 8′ 17″ N.
Variation for Longitude 24° W. - +44

21 9 1 N.

Example II.—

What is the Sun's declination, 20th of November, 1833, in Longitude 60° West, at 10 A.M.?

By the N. A., ☉'s declination, 20th November -		19° 43′ 37″S.
Variation to 60 West Longitude - -	+2 8	1 4
Ditto to 2h. from Noon - - -	—1 4	
True declination at 10 A.M. in Longitude 60 West		19 44 41

TABLE XVI.

To reduce the Sun's Right Ascension to any given Meridian, and to any time under that Meridian.

This Table enables you to ascertain the Sun's true Right Ascension at any required time, at any Meridian. Enter it with R A. at the top, and the Longitude or given time at the side columns, at the angle of meeting will be the correction to be added or subtracted according to the direction in the Table.

Example.—Required the Sun's Right Ascension, Nov. 27, 1833, in Longitude 30° West?

By the N. A. for 1833, the R. A. is	16h 12′ 28″	at the Mer. of Greenwich.
Under 16h. & opp. 30° of W. Lon.	+ 21	
True R.A. at the Mer. of 30° W.	16 12 49	

Note.—Should there be any hours in the time, take the corrections answering to them and the R. A. as before, and apply them as directed in the Table.

TABLE XVII.

Log-sine, Tangents and Secants, to every Point and Half-point of the Compass.

This Table is to be used in the same manner as the artificial Sine, Tangents, and Secants; the only difference between them is, that the degrees and minutes are given in points here.

TABLE XVIII.

The Logarithms of Numbers.

This Table has long been in the hands of the public, consequently its general usefulness is universally known. It is not necessary to give an account of its origin, which would only be an interruption to the present course of our studies, I will therefore proceed with its use and application.

The Logarithm of any number to 4 places of figures, may be found at once by bringing any of the figures at the top of the column to join any other three figures, that is, suppose you wished to find the Logarithm 3328, make it 332.8, then opposite 332 and under 8 at the top, you will find the Log. 3,522183 for the true Log. of 3328; taking notice always that the Index is one less than the places of figures, for, supposing the number was 332.8, the Index would be 2. If the Log.

of any number higher than 4 places were required, you must take the difference between any two entries from the column at the right hand side, then multiply that difference by the figures not found among the whole numbers. Cut off one, two, or more places from the product according to the number of places you multiply, and add the remainder to the nearest Log, the sum will be the true Log required.

Example.—Suppose you were required to find the Log. of 33285 here the Log of 3328 is 4.522183, and the difference is 131, (which multiplied by 5 gives 655. Cutting off one place will give 66, which being added to 4.522183 gives 4.522249 for the Log of 33285. If you wish the square root or any other power to be extracted, divide the numbe given, by the Index of the given power, and take the natural numbe answering to the quotient for the root required. The sum of the Logs of any two or more numbers, gives the Logarithm of the product of the same numbers, and the difference of any two Logs. gives the quotien of the one divided by the other. The above will, I trust, be sufficien to give the Navigator a competent knowledge of the use of this Table without encumbering his mind with unnecessary examples.

TABLE XIX.

Logarithms of Sines.

This Table is likewise too generally known to require me to ente largely on a subject which would only tend to increase the bulk o my work, without benefiting the pupil. It contains the Logarithm of the Natural Sines and Secants; for if you enter the Table of common Logarithms with the Natural Sines, Tangents, or Secants, you will find the Logs. contained in this Table To use this Table you must take the degrees at the top, and the minutes in the left-hand column when they are under 45°; from thence to 90°, they are to be found a the bottom, and the miles in the right-hand column, the Logs. required will be at the angle of meeting in the column titled accordingly

If any odd seconds be given, take the difference from th column of differences, multiply it by the odd seconds, cut off tw places from the right, add or subtract the remaining figures at th left, to or from the logs found according as they are increasing or decreasing. Their sum or difference will be the true log required.

Example.—Required the Log-sine of 32° 30′ 8″.

The Log-sine of 32° 30′ 8″ is	9.730217
Diff. 330 × 8 = 26.40	+26
Log-sine of 32 30 8	9.730243

The same may be observed of the Tangents and Secants.

TABLE XX.

Natural Sines.

Like the two last, this Table is in general well known, therefore the following concise sketch of its use will be all that is requ site, and will answer for its application. The semi-diameter of circle is considered only 1, consequently all other lines or sines in it are shorter or decimal parts of that radius, and are calculated in this Table. Use this Table as that of the Artificial Sines, Tangents, and Secants, and if any odd seconds be given, multiply the difference at the bottom of that column by the odd seconds, cut off two places from the right, then add or subtract the remaining figures on the left-hand to or from the Natural Sine, found according as the Table is increasing or decreasing, their sum or difference will be the true Natural Sine required.

Example.—Suppose it was required to find the Natural Sine to 20° 30′ 20″.

Natural Sine to 20° 30′ 20″	350207
Diff. 454+20=90.80	91
Natural Sine of 20° 30′ 20″	350298

TABLE XXI.

Of Log-rising or Log-Versed Sines.

This Table contains the Logarithms of the Natural Versed Sines of any part of a circle, and is of great use in different parts of astronomy; but it will be as well to shew its application in this work, where it has reference to the hours from noon or midnight. The degrees, &c. of the arch are brought into hours, allowing 15° for each hour, and the logs. are given opposite the minutes, &c. as if they were expressed in parts of the circle. To use this Table, you have only to find the hours at the top, the minutes in the left-hand column, and the nearest second at the top of any of the columns, at the angle of meeting will be the log. required. If any odd seconds be given, which are not found in the top column, you must find them on the left-hand side of the Table, and directly answering to them will be a proportional part, which must be added to the former log. for the log-rising required.

Example.—Suppose you were required to find the Log-versed sine of 2 hours, 20 minutes, and 42 seconds?

Here the Log-versed Sine of 2h 20′ 40″ is	4.26131
Proportional parts to 2 seconds are -	21
Log. V.S. of 2h 20′ 42″ is - -	4.26152

TABLE XXII.

The Mean Reduction of the Moon's Horizontal Parallax, answering to any Latitude according to the Figure of the Earth.

Example.—Suppose the Equatorial Horizontal Parallax 14′ 40″, what is it in Latitude 52°? Reduction answering to 52° is 7″, taken from 14′ 40″, gives 14′ 33″ for the true Horizontal Parallax in Latitude 52° N. or S.

TABLE XXIII.

Correction of the Moon's Apparent Altitude.

In this Table you will find the Corrections of the Moon's Apparent Altitude by inspection far the more ready mode of operation.

To use this Table correctly, you must reduce the Equatorial Horizontal Parallax to the Latitude of the place, and then find the nearest to it in the top column, and the Apparent Altitude on the left-hand; directly at the angle of meeting stands the correction. If any odd seconds be given in the parallax not found in the Table, you must find the proportional parts on the left-hand side of the Table, which are to be added. But should there be any odd minutes in the Apparent Altitude, you will find the proportional parts answering to them at the bottom, and subtract them.

Example.—Suppose you were required to find the correction of the Moon's Apparent Altitude 42° 12, the Horizontal Parallax by the Nautical Almanac 57′ 23″, in Latitude 52 N.

Her Horizontal Parallax - - -	57′ 23″
Reduction to Latitude 52° according to the figure	7 of the Earth.
Reduced Horizontal Parallax in Latitude 52	57 16
Then cor. to 42° 10 App. Alt. and Hor. Par. 57 is	41 12
Pro. parts to seconds of Horizontal Parallax 16′	+12
Pro. parts to 2 minutes of Alt. from bottom	1
True cor. to the Moon's App. Alt. 42° 12′ and Hor. Par 57′ 16″	41 23

TABLE XXIV.

The true and Apparent Altitudes.

In this Table, you will find the Apparent Altitude in the left-hand column, directly opposite it will stand the correction.

Example.—Suppose the Apparent Altitude of the Sun's centr were 32° 30′, what is the true Altitude?

Opposite 32 in column marked Apparent Altitude, stands 31° 58′ 36 in the column marked Corrected Altitude, which is the true Altitude ?

If the Apparent Altitude has any odd minutes not found, it will b proper to take proportional parts of the Corrected Altitudes answering to them.

TABLE XXV.

The Refracted Semi-diameter of the Moon.

This Table contains the Refracted Semi-diameter of the Moon increased by the refraction from the lower limb to the centre, and i necessary in finding the Apparent Altitude of her centre, and ought t be used in clearing a Lunar distance. For Example: let the Altitude o the Moon's lower limb be 5° 00 and her semi-diameter 14′ 40″, what is the Apparent Altitude of her centre? against 5° in column marked Apparent Altitude, and under semi-diameter 14 40″, stands 15′ 7″ for the Apparent or Refracted Semi-diameter of the Moon, therefore, 5°+15′ 7″ would be the Apparent Altitude of her centre, as if taken by a quadrant.

Remark.—As it is impossible to take the Apparent Altitude of either the Sun or Moon's centre, when no remarkable point in these luminary bodies is given, the application of this Table will ascertain it. It is evident, that could the angle formed by the limb and centre be measured with an instrument, it would exceed that given in the Nautical Almanac; for the arch of Altitude from the limb to the centre is affected with the refraction, as well as the Altitude itself; for even to find the Apparent Altitude of the Moon's centre in the above Example by the usual method, it would run thus: the semi-diameter being 14′ 40″, and the augmentation to 5° of Altitude 2″, the augmented semi-diameter is 14′ 42″; then, according to the usual method, the Apparent Altitude of her centre would be 5° 14 42, differing from the former; it is inconsistent with reason to add a part of a correct arch to one that is incorrect, and thereby render the whole incorrect. The semi-diameter is a part of a correct arch, and the Altitude part of an incorrect one. The true Altitude may be correctly ascertained, by finding the correct Altitude of their limbs, and applying the semi-diameter thereto; for in that case, you add a part of one correct arch to another; consequently, the whole must be correct. In some cases which may occur in Lunars when the two objects have the same or opposite Azimuths, the usual method of finding the Apparent Altitudes of the centres of the Sun and Moon, would cause a great error in clearing the true distance especially in low Altitudes, for 15″ of error in the distance give about 7½ miles of error in Longitude, therefore the former 25 would cause about 12 miles of error.

TABLE XXVI.

The Augmented Semi-diameter of the Moon.

This Table is to be used in finding the true Altitude of the Moon's centre, that is, adding the augmented semi-diameter answering to the Altitude and semi-diameter by the Nautical Almanac, to the true Altitude of her lower limb, or subtracting it from that of her upper limb, for the true Altitude of her centre. The semi-diameter of the Sun taken from the Nautical Almanac must be applied in the same way. Having corrected the Altitudes and the Observed Distance as directed by these Tables, and cleared the Lunar distance, the true Longitude will be found free from those errors which would otherwise prevail.

TABLE XXVII.

The Apparent Semi-diameter of the Sun.

This Table is of the same nature as the Table of true and Apparent Altitudes, and may be used in the same way. But the Sun being so far from the observer, his semi-diameter in Altitude does not augment; here it is only given refracted.

NOTE.—The parallax of the Sun is omitted here, for when the Apparent Altitudes are found, they must be brought to this Table, in order to find either the true Altitudes or correction.

TABLE XXVIII.

The Apparent Semi-diameter of the Sun or Moon from the centre, to any part of the circumference.

This Table is generally useful in finding the apparent central distances between the Sun, Moon, or Stars. As the refraction vanishes towards the Zenith, the lower limbs of the Sun or Moon will be more refracted than their centres, so that the semi-diameter perpendicular to the plane of the horizon must be greater than that parallel to it, vanishing from the lower to the upper point of the limb, which gives the Sun or Moon the appearance of not being round, but piqued to the horizon, and flattened from the top, which effect is caused by the refraction. Therefore, in taking an angular distance between these bodies, if you bring a star to touch the lower part of the Moon's limb, it is evident that it would be further from her centre than if it were brought to touch it at any part from thence to the upper point, which proves that if but one semi-diameter be taken, common to all the circumference, the operation must be incorrect. To remedy this, enter this Table with the altitude at the top, and take, according to the best judgment, the number of degrees from the lower point of the limb, where you touch the object, (which may partly be done by observing the inclination of the quadrant to the horizon.) Then find that angle in the column marked degrees of circumference, and at the angle of meeting will be the augmentation of the refraction, or the semi-diameter from the centre to that part of the circumference, which must be added to the semi-diameter taken from the Nautical Almanac for the apparent semi-diameter; this being added to the apparent distance, gives the apparent central distance. For Example: Suppose the apparent distance between a Star and the Moon 68° 32′ 30″, and from the best judgment the Star touched 36° of the Moon's lower circumference, the semi-diameter of the Moon at that time by the Nautical Almanac being 14′ 30″, and her altitude 48°, I demand the central apparent distance?

Under altitude 14° and opposite 36° in a circumference column, gives 14″ for the augmentation caused by the refraction, or the semi-diameter, therefore the apparent semi-diameter 14′ 44″, added to 68° 32′ 30″ gives 68° 47′ 14″ for the apparent central distance.

REMARK.—The upper semi-diameter may be found to differ from the lower, but the difference is not worthy of notice. Again, if the observed distance between the Sun and Moon be taken, the augmentation of both their semi-diameters, must be found and applied as before.

TABLE XXIX.

The Correction arising from the Dip aud Semi-diameter of the Sun and Moon.

This Table contains the correction to be applied to the Altitude of the Sun and Moon, in order to find their true Altitudes, in ascertaining the Latitude. Thus, when you have the true altitude of the limb enter the Table, then under the semi-diameter, and opposite the height of the eye you will find a correction to be applied to the altitude.

Example.—Suppose the true altitude of the Sun or Moon's centre is 32° 10′, the semi-diameter 15′ 30″, the height of the eye 30 feet, what will be the correction?

Under 15′ 30″ and opposite 30 feet is 10′ 16″, which added to the ltitude 32° 10′ gives 32° 20′ 16″ for the true altitude.

TABLE XXX.

Correction of the Star's Altitude.

This Table contains the sum of the Dip and Refraction which is always to be subtracted from the Star's Altitude. For Example: suppose the Observed Altitude of a Star 41° 20′, the height of the eye 20 feet, what is his true Altitude?

Under 20 feet, and opposite 41°, you will find 5′ 17″ at the angle of meeting for correction, which, taken from 41° 20′, gives 41° 14′ 43″ for the true Altitude.

TABLE XXXI.

To reduce the Altitude according to the Figure of the Earth

As the spheroidal figure of the earth causes a difference in the Altitudes, a correction from this Table answering to the Latitude of the place of observation and the azimuth of the object will give the proper Altitude to be used in any spherical calculation. The azimuth of the object will be found at the top to 90° from the Meridian, and at the bottom from 90° to 180°. The Latitude of the place of observation is in the right or left-hand column, and at the angle of meeting will stand the correction to be applied to the observed Altitude according to the Sign.

Example.—Suppose in Latitude 52° N. the Altitude of the Sun's centre was 32° 30′ 9″, its azimuth 60° from S. to E., what is his true Altitude?

	32° 30′ 9″	
Under 60° and opposite 52° gives - -	+ 5 40	
True Altitude according to the figure of -	32 35 49	the Earth.

TABLE XXXII.*

The Sun's Declination.

This Table contains the Sun's declination at noon at Greenwich, for every day in the year to 1846, and is used as follows:—

Enter the Table with the day of the month, and under the given month stands the declination at the angle of meeting. For Example:

Let the Sun's declination be required for October the 12th, 1833. Opposite 12 and under October gives 7° 25′ S. for the declination.

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* For the Use of Table XXXIII., see page 60.

TABLE XXXIV.

To reduce the Moon's Horizontal Parallax to any time under the Meridian of Greenwich.

The reduced time from noon or midnight will be found at the top, and the difference in 12 hours at the left-hand column, at the angle of meeting will be the correction or proportional part to be applied.

EXAMPLE.—Suppose the Moon's Horizontal Parallax at noon was 59′ 5″, and at midnight 59′ 14″, what is it at 7 A. M.? Under 7 hours at the top and opposite 9″ difference in 12 hours, you will find 5″, which added to 59′ 5″, because it is increasing, gives 59′ 10″ at 7.

TABLE XXXV.

Luni-solar Table.

This Table contains the result of $\frac{\text{sine } 2h \ \text{sine } H}{\text{cos } h' \ \text{cos } H'}$, (see the formula p. 38) It is to be entered with the Moon's Apparent Altitude at the top, and her horizontal parallax corrected for the Latitude of the place; at the left-hand side at the angle of meeting will be the Log or result of the former part of the formula, when corrected by the small Table at the end.

EXAMPLE.—Suppose the Apparent Altitude of the Moon's centre 24°, and her Horizontal Parallax 58′ 10″, and that of the Sun 32°, required the Luni-solar Log?

Under 24° of Altitude found at the top, and opposite 58′ 10″ horizontal parallax on the left-hand column, stands 298223 at the angle of meeting; again, in the small Table opposite 32°, the Sun's Altitude gives 10 for correction, which subtracted from the above Log, gives 298213 for the true Luni-solar Log.

TABLE XXXVI.

Proportional Logarithms.

This Table is intended to reduce the angular distance between the Sun, Moon, or fixed Stars to the time of observation, but may be applied to several other purposes which have a reference to the present subject. The Table extends to 3 hours, being the intervals to which the distances are computed in the Nautical Almanac. On other occasions they may be considered as degrees. At the top of the page you will find the hours and minutes, and on the left-hand the seconds, and at the angle of meeting the proportional Logs. *(See the use of this in the Lunars, page* 42, 43.*)*

TABLE XXXVII.

The Right Ascension and Declination of some of the Principal Fixed Stars.

This Table contains the Right Ascension and Declination of some of the Principal Fixed Stars for the beginning of January, 1833, with their annual variation in Right Ascension and Declination, which may be found for any future year, by multiplying the annual variation either of the Right Ascension or Declination, by the number of years which have elapsed. Observe that the product must be added to or subtracted from the Right Ascension and Declination of the Star in the proposed year, according as the Sign directs in the Table. Their sum or difference will give the Right Ascension andDeclination of the Star that year. This Table is so simple, that one Example will serve to shew its use.

Example.—What will be the Right Ascension and Declination of egulus, January the 1st, 1836?

Regulus, 1st Jan. 1833, Decli:	12°	46′	51″	4	Ann. Var.	3″	21
		—	9	63			3
Declination 1st Jan. 1836	12	46	41	41		9	63
Regulus, 1st Jan, 1833, R. A.	9°	59′	28″	35	Ann. Var.	17″	3
		+	51	9			3
Right Ascen. for 1st. Jan. 1836	10	00	19	44		51	9

The Declination is given in degrees, minutes, and seconds. The Ann. Var. in seconds, and hundreds of seconds.

TABLE XXXIII.

To correct the Sun's Declination for the changes in periods of four years.

The Sun's Declination in Table XXXII, is given for the Years 1831 to 1846, which Table must be corrected by this, for the change which takes place in every four years. Enter this Table with the period of years in either of the side columns, and under the nearest day of the given month found in the top column, at the angle of meeting will be the correction to be applied to the Declination according as the Table directs. Example.—Required the Sun's Declination, July 6th, 1837, at the Meridian of Greenwich.

The Declination, 6th of July, 1825, is - - -	22°	43′ N.
Opposite a period of 12 years, and under July, will be	—	1
True Declination, July 6th, 1837 -	22	42 N.

TABLE I.

Difference of Latitude and Departure for ¼ Point.

Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.
1	01.0	00.0	61	60.9	03.0	121	120.9	05.9	181	180.8	08.9	241	240.7	11.8
2	02.0	00.1	62	61.9	03.0	122	121 9	06.0	182	181.8	08.9	242	241.7	11.9
3	03.0	00.1	63	62.9	03.1	123	122.9	06.0	183	182.8	09.0	243	242.7	11.9
4	04.0	00.2	64	63.9	03.1	124	123.9	06.1	184	183.8	09.0	244	243.7	12.0
5	05.0	00.2	65	64.9	03.2	125	124.9	06.1	185	184.8	09.1	245	244.7	12.0
6	06.0	00.3	66	65.9	03.2	126	125.8	06.2	186	185.8	09.1	246	245.7	12.1
7	07.0	00 3	67	66.9	03.3	127	126 8	06.2	187	186.8	09.2	247	246.7	12.1
8	08.0	00.4	68	67.9	03.3	128	127.8	06.3	188	187.8	09.2	248	247.7	12.2
9	09.0	00.4	69	68.9	03.4	129	128.8	06.3	189	188.8	09.3	249	248.7	12.2
10	10.0	00.5	70	69.9	03.4	130	129.8	06.4	190	189.8	09.3	250	249.7	12.3
11	11.0	00.5	71	70.9	03.5	131	130.8	06.4	191	190.8	09.4	251	250.7	12.3
12	12.0	00.6	72	71.9	03.5	132	131.8	06 5	192	191.8	09.4	252	251.7	12.4
13	13.0	00.6	73	72.9	03.6	133	132.8	06.5	193	192.8	09.5	253	252.7	12.4
14	14.0	00.7	74	73.9	03.6	134	133.8	06.6	194	193.8	09.5	254	253.7	12.5
15	15.0	00.7	75	74.9	03.7	135	134.8	06.6	195	194.8	09.6	255	254.7	12.5
16	16.0	00 8	76	75.9	03.7	136	135.8	06.7	196	195.8	09.6	256	255.7	12.6
17	17.0	00.8	77	76.9	03.8	137	136.8	06.7	197	196.8	09.7	257	256.7	12.6
18	18.0	00.9	78	77.9	03.8	138	137.8	06.8	198	197.8	09.7	258	257.7	12.7
19	19.0	00.9	79	78.7	03.9	139	138.8	06.8	199	198.8	09.8	259	258.7	12.7
20	20.0	01.0	80	79.9	03.9	140	139.8	06.9	200	199.8	09.8	260	259.7	12.8
21	21.0	01.0	81	80.9	04.0	141	140.8	06.9	201	200.8	09.9	261	260.7	12.8
22	22.0	01.1	82	81.9	04.0	142	141.8	07.0	202	201.8	09.9	262	261.7	12.9
23	23.0	01.1	83	82.9	04.1	143	142.8	07.0	203	202.8	10.0	263	262.7	12.9
24	24.0	01.2	84	83.9	04.1	144	143.8	07.1	204	203.8	10.0	264	263.7	13.0
25	25.0	01.2	85	84.9	04.2	145	144.8	07.1	205	204.8	10.1	265	264.7	13.0
26	26.0	01.3	86	85.9	04.2	146	145.8	07.2	206	205.8	10.1	266	265.7	13.1
27	27.0	01.3	87	86.9	04.3	147	146.8	07.2	207	206.8	10.2	267	266.7	13.1
28	28.0	01.4	88	87.9	04.3	148	147.8	07.3	208	207.8	10.2	268	267.7	13.2
29	29.0	01.4	89	88.9	04.4	149	148.8	07.3	209	208.8	10.3	269	268.7	13.2
30	30.0	01.5	90	89.9	04.4	150	149.8	07.4	210	209.8	10.3	270	269.7	13.3
31	31.0	01.5	91	90.9	04.5	151	150.8	07.4	211	210.7	10.4	271	270.7	13.3
32	32.0	01.6	92	91.9	04.5	152	151.8	07.5	212	211.7	10.4	272	271.7	13.3
33	33.0	01.6	93	92.9	04.6	153	152.8	07.5	213	212.7	10.5	273	272.7	13.4
34	34.0	01.7	94	93.9	04.6	154	153.8	07.6	214	213.7	10.5	274	273.7	13.4
35	35.0	01.7	95	94.9	04.7	155	154.8	07.6	215	214.7	10.6	275	274.7	13.5
36	36.0	01.8	96	95.9	04.7	156	155.8	07.7	216	215.7	10.6	276	275.7	13.5
37	37.0	01.8	97	96.9	04.8	157	156.8	07.7	217	216.7	10.7	277	276.7	13.6
38	38.0	01.9	98	97.9	04.8	158	157.8	07.8	218	217.7	10.7	278	277.7	13.6
39	39.0	01.9	99	98.9	04.9	159	158.8	07.8	219	218.7	10.8	279	278.7	13.7
40	40.0	02.0	100	99.9	04.9	160	159.8	07.9	220	219.7	10.8	280	379.7	13.7
41	41.0	02.0	101	100.9	05.0	161	160.8	07.9	221	220.7	10.8	281	280.7	13.8
42	41.9	02.1	102	101.9	05.0	162	161.8	08.0	222	221.7	10 9	282	281.7	13.8
43	42.9	02.1	103	102.9	05.1	163	162.8	08.0	223	222.7	10.9	283	282.7	13.9
44	43.9	02.2	104	103.9	05.1	164	163.8	08.1	224	223.7	11.0	284	283.7	13.9
45	44.9	02.2	105	104.9	05.2	165	164.8	08.1	225	224.7	11.0	285	284.7	14.0
46	45.9	02.3	106	105.9	05.2	166	165.8	08.2	226	225.7	11.1	286	285.7	14.0
47	46.9	02.3	107	106.9	05.3	167	166.8	08.2	227	226.7	11.1	287	286.7	14.1
48	47.9	02.4	108	107.9	05.3	168	167.8	08.2	228	227.7	11.2	288	287.7	14.1
49	48.9	02.4	109	108.9	05.4	169	168.8	08.3	229	228.7	11.2	289	288.7	14.2
50	49.9	02.5	110	109.9	05.4	170	109.8	08.3	230	229 7	11.3	290	289.7	14.2
51	50.9	02.5	111	110.9	05.5	171	170 8	08.4	231	230.7	11.3	291	290.7	14.3
52	51.9	02.6	112	111.9	05.5	172	171.8	08.4	232	231.7	11.4	292	291.7	14.3
53	52.9	02.6	113	112.9	05.5	173	172.8	08.5	233	232.7	11.4	293	292.7	14.4
54	53.9	02.7	114	113.9	05.6	174	173.8	08.5	234	233 7	11.5	294	293.6	14.4
55	54.9	02.7	115	114.9	05.6	175	174.8	08.6	235	234.7	11.5	295	294.6	14.5
56	55.9	02.8	116	115.9	05.7	176	175.8	08.6	236	235.7	11.6	296	295.6	14.5
57	56.9	02.8	117	116.9	05.7	177	176.8	08.7	237	236.7	11.6	297	296.6	14.6
58	57.9	02.9	118	117.9	05.8	178	177.8	08.7	238	237.7	11.7	298	297.6	14.6
59	58.9	02.9	119	118.9	05.8	179	178.8	08.8	239	238.7	11.7	299	298.6	14.7
60	59.9	02.9	112	119.9	05 9	180	179.8	08.8	240	239.7	11.8	300	299.6	14.7
Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.

A

For 7¾ Points.

TABLE I.

Difference of Latitude and Departure for ½ Point.

Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.
1	01.0	00.1	61	60.7	06.0	121	120.4	11.9	181	180.1	17.7	241	239.8	23.6
2	02.0	00.2	62	61.7	06.1	122	121.4	12.0	182	181.1	17.8	242	240.8	23.7
3	03.0	00.3	63	62.7	06.2	123	122.4	12.1	183	182.1	17.9	243	241.8	23.8
4	04.0	00.4	64	63.7	06.3	124	123.4	12.2	184	183.1	18.0	244	242.8	23.9
5	05.0	00.5	65	64.7	06.4	125	124.4	12.3	185	184.1	18.1	245	243.8	24.0
6	06.0	00.6	66	65.7	06.5	126	125.4	12.3	186	185.1	18.2	246	244.8	24.1
7	07.0	00.4	67	66.7	06.6	127	126.4	13.4	187	186.1	18.3	247	245.8	24.2
8	08.0	00.8	68	67.7	06.7	128	127.4	12.5	188	187.1	18.4	248	246.8	24.3
9	09.0	00.9	69	68.7	06.8	129	128.4	12.6	189	188.1	18.5	249	247.8	24.4
10	10.0	01.0	70	69.7	06.9	130	129.4	12.7	190	189.1	18.6	250	248.8	24.5
11	10.9	01.1	71	70.7	07.0	131	130.4	12.8	191	190.1	18.7	251	249.8	24.6
12	11.9	01.2	72	71.7	07.1	132	131.4	12.9	192	191.1	18.8	252	250.8	24.7
13	12.9	01.3	73	72.6	07.2	133	132.4	13.0	193	192.1	18.9	253	251.8	24.8
14	13.9	01.4	74	73.6	07.3	134	133.3	13.1	194	193.1	19.0	254	252.8	24.9
15	14.9	01.5	75	74.6	07.4	135	134.3	13.2	195	194.1	19.1	255	253.8	25.0
16	15.9	01.6	76	75.6	07.4	136	135.3	13.3	196	195.1	19.2	256	254.8	25.1
17	16.9	01.7	77	76.6	07.5	137	136.3	13.4	197	196.1	19.3	257	255.8	25.2
18	17.9	01.8	78	77.6	07.6	138	137.3	13.5	198	197.0	19.4	258	256.8	25.3
19	18.9	01.9	79	78.6	07.7	139	138.3	13.6	199	198.0	19.5	259	257.8	25.4
20	19.9	02.0	80	79.6	07.8	140	139.3	13.7	200	199.0	19.6	260	258.7	25.5
21	20.9	02.1	81	80.6	07.9	141	140.3	13.8	201	200.0	19.7	261	259.7	25.6
22	21.9	02.2	82	81.6	08.0	142	141.3	13.9	202	201.0	19.8	262	260.7	25.7
23	22.9	02.3	83	82.6	08.1	143	142.3	14.0	203	202.0	19.9	263	261.7	25.8
24	23.9	02.4	84	83.6	08.2	144	143.3	14.1	204	203.0	20.0	264	262.7	25.9
25	24.9	02.4	85	84.6	08.3	145	144.3	14.2	205	204.0	20.1	265	263.7	26.0
26	25.9	02.5	86	85.6	08.4	146	145.3	14.3	206	305.0	20.2	266	264.7	26.1
27	26.9	02.6	87	86.6	08.5	147	146.3	14.4	207	206.0	20.3	267	265.7	26.2
28	27.9	02.7	88	87.6	08.6	148	147.3	14.5	208	207.0	20.4	268	266.7	26.3
29	28.9	02.8	89	88.6	08.7	149	148.3	14.6	209	208.0	20.5	269	267.7	26.4
30	29.9	02.9	90	89.6	08.8	150	149.3	14.7	210	209·0	20.6	270	268.7	26.5
31	30.9	03.0	91	90.6	08.9	151	150.3	14.8	211	210.0	20.7	271	269.7	26.6
32	31.8	03.1	92	91.6	09.0	152	151.3	14.9	212	211.0	20.8	272	270.7	26.7
33	31.8	03.2	93	92.6	09.1	153	152.3	15.0	213	212.0	20.9	273	271.7	26.8
34	33.8	03.3	94	93.5	09.2	154	153.3	15.1	214	213.0	21.0	274	272.7	26.9
35	34.8	03.4	95	94.5	09.3	155	154.3	15.2	215	214.0	21.1	275	273.7	27.0
36	35.8	03.5	96	95.5	09.4	156	155.3	15.3	216	215.0	21.2	276	274.7	27.1
37	36.8	03.6	97	96.5	09.5	157	156.3	15.4	217	216.0	21.3	277	275.7	27.2
38	37.8	03.7	98	97.5	09.6	158	157.3	15.5	218	216.9	21.4	278	276.7	27.3
39	38.8	03.8	99	98.5	09.7	159	158.3	15.6	219	217.9	21.5	279	277.7	27.4
40	39.8	03.9	100	99.5	09.8	160	159.2	15.7	220	218.9	21.6	280	278.7	27.5
41	40.8	04.0	101	100.5	09.9	161	160.2	15.8	221	219.9	21.7	281	279.6	27.5
42	41.8	04.1	102	101.5	10.0	162	161.2	15.9	222	220.9	21.8	282	280.6	27.6
43	42.8	04.2	103	102.5	10.1	163	162.2	16.0	223	221.9	21.9	283	281.6	27.7
44	43.8	04.3	104	103.5	10.2	164	163.2	16.1	224	222.9	22.0	284	282.6	27.8
45	41.8	04.4	105	104.5	10.3	165	164.2	16.2	225	223.9	22.1	285	283.6	27.9
46	45.8	04.5	106	105.5	10.4	166	165.2	16.3	226	224.9	22.2	286	284.6	28.0
47	46.8	04.6	107	106.5	10.5	167	166.2	16.4	227	225.9	22.2	287	285.6	28.1
48	47.8	04.7	108	107.5	10.6	168	167.2	16.5	228	226.9	22.3	288	286.6	28.2
49	48.8	04.8	109	108.5	10.7	169	168.2	16.6	229	227.9	22.4	289	287.6	28.3
50	49.8	04.9	110	109.5	10.8	170	169.2	16.7	230	228.9	22.5	290	288.6	28.4
51	50.8	05.0	111	110.5	10.9	171	170.2	16.8	231	229.9	22.6	291	289.6	28.5
52	51.7	05.1	112	111.5	11.0	172	171.2	16.9	232	230.9	22.7	292	290.6	28.6
53	52.7	05.2	113	112.5	11.1	173	172.2	17.0	233	231.9	22.8	293	291.6	28.7
54	53.7	05.3	114	113.5	11.2	174	173.2	17.1	234	232.9	22.9	294	292.6	28.8
55	54.7	95.4	115	114.4	11.3	175	174.2	17.2	235	233.9	23.0	295	293.6	28.9
56	55.7	05.5	116	115.4	11.4	176	175.2	17.3	236	234.9	23.1	296	294.6	29.0
57	56.7	05.6	117	116.4	11.5	177	176.2	17.4	237	235.9	23.2	297	295.6	29.1
58	57.7	05.7	118	117.4	11.6	178	177.1	17.4	238	236.9	23.3	298	296.6	29.2
59	58.7	05.8	119	118.4	11.7	179	178.1	17.5	239	237.8	23.4	299	297.6	29.3
60	59.7	05.9	120	119.4	11.8	180	179.1	17.6	240	338.8	23.5	300	298.6	29.4
Dist	Dep	Lat.	Dist	Dep.	Lat	Dist	Dep	Lat.	Dist	Dep.	Lat.	Dist	Dep	Lat.

For 7½ Points.

TABLE I.

Difference of Latitude and Departure for ¾ Point.

Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.
1	01.0	00.1	61	60.3	09.0	121	119.7	17.8	181	179.0	26.6	241	238.4	35.4
2	02.0	00.3	62	61.3	09.1	122	120.7	17.9	182	180.0	26.7	242	239.4	35.5
3	03.0	00.4	63	62.3	09.2	123	121.7	18.1	183	181.0	26.9	243	240.4	35.7
4	04.0	00.6	64	63.3	09.4	124	122.7	18.2	184	182.0	27.0	244	241.4	35.8
5	04.9	00.7	65	64.3	09.5	125	123.7	18.3	185	183.0	27.2	245	242.4	36.0
6	05.9	00.9	66	65.3	09.7	126	124.6	18.5	186	184.0	27.3	246	243.3	36.1
7	06.9	01.0	67	66.3	09.8	127	125.6	18.6	187	185.0	27.4	247	244.3	36.2
8	07.9	01.2	68	67.3	10.0	128	126.6	18.8	188	186.0	27.6	248	245.3	36.4
9	08.9	01.3	69	68.3	10.1	129	127.6	18.9	189	187.0	27.7	249	246.3	36.5
10	09.9	01.5	70	69.2	10.3	130	128.6	19.1	190	187.9	27.9	250	247.3	36.7
11	10.9	01.6	71	70.2	10.4	131	129.6	19.2	191	188.9	28.0	251	248.3	36.8
12	11.9	01.8	72	71.2	10.6	132	130.6	19.4	192	189.9	28.2	252	249.3	37.0
13	12.9	01.9	73	72.2	10.7	133	131.6	19.5	193	190.9	28.3	253	250.3	37.1
14	13.9	02.1	74	73.2	10.9	134	132.6	19.7	194	191.9	28.5	254	251.3	37.3
15	14.8	02.2	75	74.2	11.0	135	133.5	19.8	195	192.9	28.6	255	252.2	37.4
16	15.8	02.3	76	75.2	11.2	136	134.5	20.0	196	193.9	28.8	256	253.2	37.6
17	16.8	02.5	77	76.2	11.3	137	135.5	20.1	197	194.9	28.9	257	254.2	37.7
18	17.8	02.6	78	77.2	11.4	138	136.5	20.3	198	195.9	29.1	258	255.2	37.9
19	18.8	02.8	79	78.1	11.6	139	137.5	20.4	199	196.8	29.2	259	256.2	38.0
20	19.8	02.9	80	79.1	11.7	140	138.5	20.5	200	197.8	29.4	260	257.2	38.2
21	20.8	03.1	81	80.1	11.9	141	139.5	20.7	201	198.8	29.5	261	258.2	38.3
22	21.8	03.2	82	81.1	12.0	142	140.5	20.8	202	199.8	29.6	262	259.2	38.4
23	22.8	03.4	83	82.1	12.2	143	141.5	21.0	203	200.8	29.8	263	260.2	38.6
24	23.7	03.5	84	83.1	12.3	144	142.4	21.1	204	201.8	29.9	264	261.1	38.7
25	24.7	03.7	85	84.1	12.5	145	143.4	21.3	205	202.8	30.1	265	262.1	38.9
26	25.7	03.8	86	85.1	12.6	146	144.4	21.4	206	203.8	30.2	266	263.1	39.0
27	26.7	04.0	87	86.1	12.8	147	145.4	21.6	207	204.8	30.4	267	264.1	39.2
28	27.7	04.1	88	87.1	12.9	148	146.4	21.7	208	205.8	30.5	268	265.1	39.3
29	28.7	04.3	89	88.0	13.1	149	147.4	21.9	209	206.7	30.7	269	266.1	39.5
30	29.7	04.4	90	89.0	13.2	150	148.4	22.0	210	207.7	30.8	270	267.1	39.6
31	30.7	04.6	91	90.0	13.4	151	149.4	22.2	211	208.7	31.0	271	268.1	39.8
32	31.7	04.7	92	91.0	13.5	152	150.4	22.3	212	209.7	31.1	272	269.1	39.9
33	32.6	04.8	93	92.0	13.7	153	151.3	22.5	213	210.7	31.3	273	270.0	40.1
34	33.6	05.0	94	93.0	13.8	154	152.3	22.6	214	211.7	31.4	274	271.0	40.2
35	34.6	05.1	95	94.0	13.9	155	153.3	22.7	215	212.7	31.6	275	272.0	40.4
36	35.6	05.3	96	95.0	14.1	156	154.3	22.9	216	213.7	31.7	276	273.0	40.5
37	36.6	05.4	97	96.0	14.2	157	155.3	23.0	217	214.7	31.8	277	274.0	40.6
38	37.6	05.6	98	96.9	14.4	158	156.3	23.2	218	215.6	32.0	278	275.0	40.8
39	38.6	05.7	99	97.9	14.5	159	157.3	23.3	219	216.6	32.1	279	276.0	40.9
40	39.6	05.9	100	98.9	14.7	160	158.3	23.5	220	217.6	32.3	280	277.0	41.1
41	40.6	06.0	101	99.9	14.8	161	159.3	23.6	221	218.6	32.4	281	278.0	41.2
42	41.6	06.2	102	100.9	15.0	162	160.3	23.8	222	219.6	32.6	282	279.0	41.4
43	42.5	06.3	103	101.9	15.1	163	161.2	23.9	223	220.6	32.7	283	279.9	41.5
44	43.5	06.5	104	102.9	15.3	164	162.2	24.1	224	221.6	32.9	284	280.9	41.7
45	44.5	06.6	105	103.9	15.4	165	163.2	24.2	225	222.6	33.0	285	281.9	41.8
46	45.5	06.8	106	104.9	15.6	166	164.2	24.4	226	223.6	33.2	286	282.9	42.0
47	46.5	06.9	107	105.8	15.7	167	165.2	24.5	227	224.5	33.3	287	283.9	42.1
48	47.5	07.0	108	106.8	15.9	168	166.2	24.7	228	225.5	33.5	288	284.9	42.3
49	48.5	07.2	109	107.8	16.0	169	167.2	24.8	229	226.5	33.6	289	285.9	42.4
50	49.5	07.3	110	108.8	16.1	170	168.2	24.9	230	227.5	33.8	290	286.9	42.6
51	50.5	07.5	111	109.8	16.3	171	169.2	25.1	221	228.5	33.9	291	287.9	42.7
52	51.4	07.6	112	110.8	16.4	172	170.1	25.2	232	229.5	34.0	292	288.8	42.9
53	52.4	07.8	113	111.8	16.6	173	171.1	25.4	233	230.5	34.2	293	289.8	43.0
54	53.4	07.9	114	112.8	16.7	174	172.1	25.5	234	231.5	34.3	294	290.8	43.1
55	54.4	08.1	115	113.8	16.9	175	173.1	25.7	235	232.5	34.5	295	291.8	43.3
56	55.4	08.2	116	114.7	17.0	176	174.1	25.8	236	233.4	34.6	296	292.8	43.4
57	56.4	08.4	117	115.7	17.2	177	175.1	26.0	237	234.4	24.8	297	293.8	43.6
58	57.4	08.5	118	116.7	17.3	178	176.1	26.1	238	235.4	34.9	298	294.8	43.7
59	58.4	08.7	119	117.7	17.5	179	177.1	26.3	239	236.4	35.1	299	295.8	43.9
60	59.4	08.8	120	118.7	17.6	180	178.1	26.4	240	237.4	35.2	300	296.8	44.0
Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.

For 7¼ Points.

TABLE I.

Difference of Latitude and Departure for 1 Point.

Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.
1	01.0	00.2	61	59.8	11.9	121	118.7	23.6	181	177.5	35.3	241	236.4	47.0
2	02.0	00.4	62	60.8	12.1	122	119.7	23.8	182	178.5	35.5	242	237.4	47.2
3	02.9	00.6	63	61.8	12.3	123	120.6	24.0	183	179.5	35.7	243	238.3	47.4
4	03.9	00.8	64	62.8	12.5	124	121.6	24.2	184	180.5	35.9	244	239.3	47.6
5	04.9	01.0	65	63.8	12.7	125	122.6	24.4	185	181.5	36.1	245	240.3	47.8
6	05.9	01.2	66	64.7	12.9	126	123.6	24.6	186	182.4	36.3	246	241.3	48.0
7	06.9	01.4	67	65.7	13.1	127	124.6	24.8	187	183.4	36.5	247	242.3	48.2
8	07.8	01.6	68	66.7	13.3	128	125.5	25.0	188	184.4	36.7	248	243.2	48.4
9	08.8	01.8	69	67.7	13.5	129	126.5	25.2	189	185.4	36.9	249	244.2	48.6
10	09.8	02.0	70	68.7	13.7	130	127.5	25.4	190	186.4	37.1	250	245.2	48.8
11	10.8	02.1	71	69.6	13.9	131	128.5	25.6	191	187.3	37.3	241	246.2	49.0
12	11.8	02.3	72	70.6	14.0	132	129.5	25.8	192	188.3	37.5	252	247.2	49.2
13	12.8	02.5	73	71.6	14.2	133	130.5	26.0	193	189.3	37.7	253	248.1	49.4
14	13.7	02.7	74	72.6	14.4	134	131.4	26.1	194	190.3	37.8	254	249.1	49.6
15	14.7	02.9	75	73.6	14.6	135	132.4	26.3	195	191.3	38.0	255	250.1	49.7
16	15.7	03.1	76	74.5	14.8	136	133.4	26.5	196	192.2	38.2	256	251.1	49.9
17	16.7	03.3	77	75.5	15.0	137	134.4	26.7	197	193.2	38.4	257	252.1	50.1
18	17.7	03.5	78	76.5	15.2	138	135.4	26.9	198	194.2	38.6	258	253.0	50.3
19	18.6	03.7	79	77.5	15.4	139	136.3	27.1	199	195.2	38.8	259	254.0	50.5
20	19.6	03.9	80	78.5	15.6	140	137.3	27.3	200	196.2	39.0	260	255.0	50.7
21	20.6	04.1	81	79.4	15.8	141	138.3	27.5	201	197.1	39.2	261	256.0	50.9
22	21.6	04.3	82	80.4	16.0	142	139.3	27.7	202	198.1	39.4	262	257.0	51.1
23	22.6	04.5	83	81.4	16.2	143	140.3	27.9	203	199.1	39.6	263	258.0	51.3
24	23.5	04.7	84	82.4	16.4	144	141.2	28.1	204	200.1	39.8	264	258.9	51.5
25	24.5	04.9	85	83.4	16.6	145	142.2	28.3	205	201.1	40.0	265	259.9	51.7
26	25.5	05.1	86	84.4	16.8	146	143.2	28.5	206	202.0	40.2	266	260.9	51.9
27	26.5	05.3	87	85.3	17.0	147	144.2	28.7	207	203.0	40.4	267	261.9	52.1
28	27.5	05.5	88	86.3	17.2	148	145.2	28.9	208	204.0	40.6	268	262.9	52.3
29	28.4	05.7	89	87.3	17.4	149	146.1	29.1	209	205.0	40.8	269	263.8	52.5
30	29.4	05.9	90	88.3	17.6	150	147.1	29.3	210	206.0	41.0	270	264.8	52.7
31	30.4	06.0	91	89.2	17.8	151	148.1	29.5	211	207.9	41.2	271	265.8	52.9
32	31.4	06.2	92	90.2	18.0	152	149.1	29.7	212	207.9	41.4	272	266.8	53.1
33	32.4	06.4	93	91.2	18.1	153	150.1	29.9	213	208.9	41.6	273	267.8	53.3
34	33.3	06.6	94	92.2	18.3	154	151.0	30.0	214	209.9	41.8	274	268.7	53.5
35	34.3	06.8	95	93.2	18.5	155	152.0	30.2	215	210.9	41.9	275	269.7	53.6
36	35.3	07.0	96	94.2	18.7	156	153.0	30.4	216	211.9	42.1	276	270.7	53.8
37	36.3	07.2	97	95.1	18.9	157	154.0	30.6	217	212.8	42.3	277	271.7	54.0
38	37.3	07.4	98	96.1	19.1	158	155.0	30.8	218	213.8	42.5	278	272.7	54.2
39	38.3	07.6	99	97.1	19.3	159	156.9	31.0	219	214.8	42.7	279	273.6	54.4
40	39.2	07.8	100	98.1	19.5	160	156.9	31.2	220	215.8	42.9	280	274.6	54.6
41	40.2	08.0	101	99.1	19.7	161	157.9	31.4	221	216.8	43.1	281	275.6	54.8
42	41.2	08.2	102	100.0	19.9	162	158.9	31.6	222	217.7	43.3	282	276.6	55.0
43	42.2	08.4	103	101.0	20.1	163	159.9	31.8	223	218.7	43.5	283	277.6	55.2
44	43.2	08.6	104	102.0	20.3	164	160.9	32.0	224	219.7	43.7	284	278.5	55.4
45	44.1	08.8	105	103.0	20.5	165	161.8	32.2	225	220.7	43.9	285	279.5	55.6
46	45.1	09.0	106	104.0	20.7	166	162.8	32.4	226	221.7	44.1	286	280.5	55.8
47	46.1	09.2	107	104.9	20.9	167	163.8	32.6	227	222.6	44.3	287	281.5	56.0
48	47.1	09.4	108	105.9	21.1	168	164.8	32.8	228	223.6	44.5	288	282.5	56.2
49	48.1	09.6	109	106.9	21.3	169	165.8	33.0	229	224.6	44.7	289	283.5	56.4
50	49.0	09.8	110	107.9	21.5	170	166.7	33.2	230	225.6	44.9	290	284.4	56.6
51	50.0	10.0	111	108.9	21.7	171	167.7	33.4	231	226.6	45.1	291	285.4	56.8
52	51.0	10.1	112	109.9	21.9	172	168.7	33.6	232	227.5	45.3	292	286.4	57.0
53	52.0	10.3	113	110.8	22.0	173	169.7	33.8	233	228.5	45.5	293	287.4	57.2
54	53.0	10.5	114	111.8	22.2	174	170.7	34.0	234	229.5	45.7	294	288.4	57.4
55	53.9	10.7	115	112.8	22.4	175	171.6	34.1	235	230.5	45.9	295	289.3	57.6
56	54.9	10.9	116	113.8	22.6	176	172.6	34.3	236	231.5	46.0	296	290.3	57.7
57	55.9	11.1	117	114.8	22.8	177	173.6	34.5	237	232.5	46.2	297	291.3	57.9
58	56.9	11.3	118	115.7	23.0	178	174.6	34.7	238	233.4	46.4	298	292.3	58.1
59	57.9	11.5	119	116.7	23.2	179	175.6	34.9	239	234.4	46.6	299	293.3	58.3
60	58.8	11.7	120	117.7	23.4	180	176.5	35.1	240	235.4	46.8	300	294.2	58.5
Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.

For 7 Points.

TABLE I.

Difference of Latitude and Departure for 1¼ Point.

Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.
1	01.0	00.2	61	59.2	14.8	121	117.4	29.4	181	175.6	44.0	241	233.8	58.6
2	01.9	00.5	62	60.1	15.1	122	118.4	29.6	182	176.5	44.2	242	234.8	58.8
3	02.9	00.7	63	61.1	15.3	123	119.3	29.9	183	177.5	44.5	243	235.7	59.0
4	03.9	01.0	64	62.1	15.6	124	120.3	30.1	184	178.5	44.7	244	236.7	59.3
5	04.9	01.2	65	63.1	15.8	125	121.3	30.4	185	179.5	45.0	245	237.7	59.5
6	05.8	01.5	66	64.0	16.0	126	122.2	30.6	186	180.4	45.2	246	238.6	59.8
7	06.8	01.7	67	65.0	16.3	127	123.2	30.9	187	181.4	45.4	247	239.6	60.0
8	07.8	01.9	68	66.0	16.5	128	124.2	31.1	188	182.4	45.7	248	240.6	60.3
9	08.7	02.2	69	66.9	16.8	129	125.1	31.3	189	183.3	45.9	249	241.6	60.5
10	09.7	02.4	70	67.9	17.0	130	126.1	31.6	190	184.3	46.2	250	242.5	60.8
11	10.7	02.7	71	68.9	17.3	131	127.1	31.8	191	185.3	46.4	251	243.5	61.0
12	11.6	02.9	72	69.9	17.5	132	128.1	32.1	192	186.2	46.7	252	244.5	61.2
13	12.6	03.2	73	70.8	17.7	133	129.0	32.3	193	187.2	46.9	253	245.4	61.5
14	13.6	03.4	74	71.8	18.0	134	130.0	32.6	194	188.2	47.1	254	246.4	61.7
15	14.6	03.6	75	72.8	18.2	135	131.0	32.8	185	189.2	47.4	255	247.4	62.0
16	15.5	03.9	76	73.7	18.5	136	131.9	33.1	196	190.1	47.6	256	248.3	62.2
17	16.5	04.1	77	74.7	18.7	137	132.9	33.3	197	191.1	47.9	257	249.3	62.5
18	17.5	04.4	78	75.7	19.0	138	133.9	33.5	198	192.1	48.1	258	250.3	62.7
19	18.4	04.6	79	76.6	19.2	139	134.8	33.8	199	193.0	48.4	259	251.3	62.9
20	19.4	04.9	80	77.6	19.4	140	135.8	34.0	200	194.0	48.6	260	252.2	62.2
21	20.4	05.1	81	78.6	19.7	141	136.8	34.3	201	195.0	48.8	261	253.2	63.4
22	21.3	05.4	82	79.6	19.9	142	137.8	34.5	202	196.0	49.1	262	254.2	63.7
23	22.3	05.6	83	80.5	20.2	143	138.7	34.8	203	196.9	49.3	263	255.1	63.9
24	23.3	05.8	84	81.5	20.4	144	139.7	35.0	204	197.9	49.6	264	256.1	64.2
25	21.3	06.1	85	82.5	20.7	145	140.7	35.2	205	198.9	49.8	265	257.1	64.4
26	25.2	06.3	86	83.4	20.9	146	141.6	35.5	206	199.8	50.1	266	258.0	64.6
27	26.2	06.6	87	84.4	21.1	147	142.6	35.7	207	200.8	50.3	267	259.0	64.9
28	27.2	06.8	88	85.4	21.4	148	143.6	36.0	208	201.8	50.5	268	260.0	65.1
29	28.1	07.1	89	86.3	21.6	149	144.5	36.2	209	202.7	50.8	269	261.0	65.4
30	29.1	07.3	90	87.3	21.9	150	145.5	36.5	210	203.7	51.0	270	261.9	65.6
31	30.1	07.5	91	88.3	22.1	151	146.5	36.7	211	204.7	51.3	271	262.9	65.9
32	31.0	07.8	92	89.3	22.4	152	147.4	36.9	212	205.7	51.5	272	263.9	66.1
33	32.0	08.0	93	90.2	22.6	153	148.4	37.2	213	206.6	51.8	273	264.8	66.3
34	33.0	08.3	94	91.2	22.8	154	149.4	37.4	214	207.6	52.0	274	265.8	66.6
35	34.0	08.5	95	92.2	23.1	155	150.4	37.7	215	208.6	52.2	275	266.8	66.8
36	34.9	08.8	96	93.1	23.3	156	151.3	37.9	216	209.5	52.5	276	267.7	67.1
37	35.9	09.0	97	94.1	23.6	157	152.3	38.2	217	210.5	52.7	277	268.7	67.3
38	36.9	09.2	98	95.1	23.8	158	153.3	38.4	218	211.5	53.0	278	269.7	67.6
39	37.8	09.5	99	96.0	24.1	159	154.2	38.6	219	212.5	53.2	279	270.7	67.8
40	38.8	09.6	100	97.0	24.3	160	155.2	38.9	220	213.4	53.5	280	271.6	68.0
41	39.8	10.0	101	98.0	24.5	161	156.2	39.1	221	214.4	53.7	281	272.6	68.3
42	40.7	10.2	102	99.0	24.8	162	157.2	39.4	222	215.4	53.9	282	273.6	68.5
43	41.7	10.5	103	99.9	25.0	163	158.1	39.6	223	216.3	54.2	283	274.5	68.8
44	42.7	10.7	104	100.9	25.3	164	159.1	39.9	224	217.3	54.4	284	275.5	69.0
45	43.7	10.9	105	101.9	25.5	165	160.1	40.1	225	218.3	54.7	285	276.5	69.3
46	44.6	11.2	106	102.8	25.8	166	161.0	40.3	226	219.2	54.9	286	277.4	69.5
47	45.6	11.4	107	103.8	26.0	167	162.0	40.6	227	220.2	55.2	287	278.4	69.7
48	46.6	11.7	108	104.8	26.2	168	163.0	40.8	228	221.2	55.4	288	279.4	70.0
49	47.5	11.9	109	105.7	26.5	169	163.9	41.1	229	222.2	55.6	289	280.4	70.2
50	48.5	12.2	110	106.7	26.7	170	164.9	41.3	230	223.1	55.9	290	281.3	70.5
51	49.5	12.4	111	107.7	27.0	171	165.9	41.6	231	224.1	56.1	291	282.3	70.7
52	50.4	12.6	112	108.7	27.2	172	166.9	41.8	232	225.1	56.4	292	283.3	71.0
53	51.4	12.9	113	109.6	27.5	173	167.8	42.0	233	226.0	56.6	293	284.2	71.2
54	52.4	13.1	114	110.6	27.7	174	168.8	42.3	234	227.0	56.9	294	285.2	71.4
55	53.4	13.4	115	111.6	27.9	175	169.8	42.5	235	228.0	57.1	295	286.2	71.7
56	54.3	13.6	116	112.5	28.2	176	170.7	42.8	236	228.9	57.3	296	287.1	71.9
57	55.3	13.9	117	113.5	28.4	177	171.7	43.0	237	229.9	57.6	297	288.1	72.2
58	56.3	14.1	118	114.5	28.7	178	172.7	43.3	238	230.9	57.8	298	289.1	72.4
59	57.2	14.3	119	115.4	28.9	179	173.6	43.5	239	231.8	58.1	299	290.1	72.7
60	58.2	14.6	220	116.4	29.2	180	174.6	43.7	240	232.8	58.3	300	291.0	72.9
Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat	Dist	Dep.	Lat.

For 6¾ Points.

TABLE I.

Difference of Latitude and Departure for 1½ Point.

Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.
1	01.0	00.3	61	58.4	17.7	121	115.8	35.1	181	173.2	52.5	241	230.6	70.0
2	01.9	00.6	62	59.3	18.0	122	116.8	35.4	182	174.2	52.8	242	231.6	70.3
3	02.9	00.9	63	60.3	18.3	123	117.7	35.7	183	175.1	53.1	243	232.5	70.5
4	03.8	01.2	64	61.2	18.6	124	118.7	36.0	184	176.1	53.4	244	233.5	70.8
5	04.8	01.5	65	62.2	18.9	125	119.6	36.3	185	177.0	53.7	245	234.5	71.1
6	05.7	01.7	66	63.2	19.2	126	120.6	36.6	186	178.0	54.0	246	235.4	71.4
7	06.7	02.0	67	64.1	19.5	127	121.5	36.9	187	179.0	54.3	247	236.4	71.7
8	07.7	02.3	68	65.1	19.7	128	122.5	37.2	188	179.9	54.6	248	237.3	72.0
9	08.6	02.6	69	66.0	20.0	129	123.5	37.5	189	180.9	54.9	249	238.3	72.3
10	09.6	01.9	70	67.0	20.3	130	124.4	37.7	190	181.8	55.2	250	239.2	72.6
11	10.5	03.2	71	67.9	20.6	131	125.4	38.0	191	182.8	55.4	251	240.2	72.9
12	11.5	03.5	72	68.9	20.9	132	126.3	38.3	192	183.7	55.7	252	241.2	73.2
13	12.4	03.8	73	69.9	21.2	133	127.3	38.6	193	184.7	56.0	253	242.1	73.4
14	13.4	04.1	74	70.8	21.5	134	128.2	38.9	194	185.7	56.3	254	243.1	73.7
15	14.4	04.4	75	71.8	21.8	135	129.2	39.2	195	186.6	56.6	255	244.0	74.0
16	15.3	04.6	76	72.7	22.1	136	130.1	39.5	196	187.6	56.9	256	245.0	74.3
17	16.3	04.9	77	73.7	22.4	137	131.1	39.8	197	188.5	57.2	257	245.9	74.6
18	17.2	05.2	78	74.6	22.6	138	132.1	40.1	198	189.5	57.5	258	246.9	74.9
19	18.2	05.5	79	75.6	22.9	139	133.0	40.4	199	190.4	57.8	259	247.9	75.2
20	19.1	05.8	80	76.6	23.2	140	134.0	40.6	200	191.4	58.1	260	248.8	75.5
21	20.1	06.1	81	77.5	23.5	141	134.9	40.9	201	192.3	58.4	261	249.8	75.8
22	21.1	06.4	82	78.5	23.8	142	135.9	41.2	202	193.3	58.6	268	250.7	76.1
23	22.0	06.7	83	79.4	24.1	143	136.8	41.5	203	194.3	58.9	263	251.7	76.3
24	23.0	07.0	84	80.4	24.4	144	137.8	41.8	204	195.2	59.2	264	252.6	76.6
25	23.9	07.3	85	81.3	24.7	145	138.8	42.1	205	196.2	59.5	265	253.6	76.9
26	24.9	07.6	86	82.3	25.0	146	139.7	42.4	206	197.1	59.8	266	254.6	77.2
27	25.8	07.8	87	83.3	25.3	147	140.7	42.7	207	198.1	60.1	267	255.5	77.5
28	26.8	08.1	88	84.2	25.5	148	141.6	43.0	208	199.0	60.4	268	256.5	77.8
29	27.8	08.4	89	85.2	25.8	149	142.6	43.3	209	200.0	60.7	269	257.4	78.1
30	28.7	08.7	90	86.1	26.1	150	143.5	43.5	210	201.0	61.0	270	258.4	78.4
31	29.7	09.0	91	87.1	26.4	151	144.5	43.8	211	201.9	61.3	271	259.3	78.7
32	30.6	09.3	92	88.0	26.7	152	145.5	44.1	212	202.9	61.5	272	260.3	79.0
33	31.6	09.6	93	89.0	27.0	153	146.4	44.4	213	203.8	61.8	273	261.2	79.3
34	32.5	09.9	94	90.0	27.3	154	147.4	44.7	214	204.8	62.1	274	262.2	79.5
35	33.5	10.2	95	90.9	27.6	155	148.3	45.0	215	205.7	62.4	275	263.2	79.8
36	34.5	10.5	96	91.9	27.9	156	149.3	45.3	216	206.7	62.7	276	264.1	80.1
37	35.4	10.7	97	92.8	28.2	157	150.2	45.6	217	207.7	63.0	277	265.1	80.4
38	36.4	11.0	98	93.8	28.5	158	151.2	45.9	218	208.6	63.2	278	266.0	80.7
39	37.3	11.3	99	94.7	28.7	159	152.2	46.2	219	209.6	63.6	279	267.0	81.0
40	38.3	11.6	100	95.7	29.0	160	153.1	46.4	220	210.5	63.9	280	267.9	81.3
41	39.2	11.9	101	96.7	29.3	161	154.1	46.7	221	211.5	64.2	281	268.9	81.6
42	40.2	12.2	102	97.6	29.6	162	155.0	47.0	222	212.4	64.4	282	269.9	81.9
43	41.2	12.5	103	98.6	29.9	163	156.0	47.3	223	213.4	64.7	283	270.8	82.2
44	42.1	12.8	104	99.5	30.2	164	156.9	47.6	224	214.4	65.0	284	271.8	82.4
45	43.1	13.1	105	100.5	30.5	165	157.9	47.9	225	215.3	65.3	285	272.7	82.7
46	44.0	13.4	106	101.4	30.8	166	158.9	48.2	226	216.3	65.6	286	273.7	83.0
47	45.0	13.6	107	102.4	31.1	167	159.8	48.5	227	217.2	65.9	287	274.6	83.3
48	45.9	13.9	108	103.4	31.4	168	160.8	48.8	228	218.2	66.2	288	275.6	83.6
49	46.9	14.2	109	104.3	31.6	169	161.7	49.1	229	219.1	66.5	289	276.6	83.9
50	47.9	14.5	110	105.3	31.9	170	162.7	49.4	230	220.1	66.8	290	277.5	84.2
51	48.8	14.8	111	106.2	32.2	171	163.6	49.6	231	221.1	67.1	291	278.5	84.5
52	49.8	15.1	112	107.2	32.5	172	164.6	49.9	232	222.0	67.3	292	279.4	84.8
53	50.7	15.4	113	108.1	32.8	173	165.6	50.2	233	223.0	67.6	293	280.4	85.0
54	51.7	15.7	114	109.1	33.1	174	166.5	50.5	234	223.9	67.9	294	281.3	85.3
55	52.6	16.0	115	110.1	33.4	175	167.5	50.8	235	224.9	68.2	295	282.3	85.6
56	53.6	16.3	116	111.0	33.7	176	168.4	51.1	236	225.8	68.5	296	283.3	85.9
57	54.6	16.6	117	112.0	34.0	177	169.4	51.4	237	226.8	68.8	297	284.2	86.2
58	55.5	16.8	118	112.9	34.3	178	170.3	51.7	238	227.8	69.1	298	285.2	86.5
59	56.5	17.1	119	113.9	34.5	179	171.3	52.0	239	228.7	69.4	299	286.1	86.8
60	57.4	17.4	120	114.8	34.8	180	172.3	52.3	240	229.7	69.7	300	287.1	87.1
Dist	Dep.	Lat.	Dist	Dep.	Lat	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.

For 6½ Points.

TABLE I.

Difference of Latitude and Departure for 1¾ Point.

Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.
1	00.9	00.3	61	57.4	20.6	121	113.9	40.8	181	170.4	61.0	241	226.9	81.2
2	01.9	00.7	62	58.4	20.9	122	114.9	41.1	182	171.4	61.3	242	227.9	81.5
3	02.8	01.0	63	59.3	21.2	123	115.8	41.4	183	172.3	61.7	243	228.8	81.9
4	03.8	01.4	64	60.3	21.6	124	116.8	41.8	184	173.2	62.0	244	229.7	82.2
5	04.7	01.7	65	61.2	21.9	125	117.7	42.1	185	174.2	62.3	245	230.7	82.5
6	05.7	02.0	66	62.1	22.2	126	118.6	42.5	186	175.1	62.7	246	231.6	82.9
7	06.6	02.4	67	63.1	22.6	127	119.6	42.8	187	176.1	63.0	247	232.6	83.2
8	07.5	02.7	68	64.0	22.9	128	120.5	43.1	188	177.0	63.3	248	233.5	83.6
9	08.5	03.0	69	65.0	23.3	129	121.5	43.5	189	177.9	63.7	249	234.4	83.9
10	09.4	03.4	70	65.9	23.6	130	122.4	43.8	190	178.9	64.0	250	235.4	84.2
11	10.4	03.7	71	66.9	23.9	131	123.3	44.1	191	179.8	64.4	251	236.3	84.6
12	11.3	04.0	72	67.8	24.3	132	124.3	44.5	192	180.8	64.7	252	237.3	84.9
13	12.2	04.4	73	68.7	24.6	133	125.2	44.8	193	181.7	65.0	253	238.2	85.2
14	13.2	04.7	74	69.7	24.9	134	126.2	45.1	194	182.7	65.4	254	239.1	85.6
15	14.1	05.1	75	70.6	25.3	135	127.1	45.5	195	183.6	65.7	255	240.1	85.9
16	15.1	05.4	76	71.6	25.6	136	128.1	45.8	196	184.5	66.0	256	241.0	86.2
17	16.0	05.7	77	72.5	25.9	137	129.0	46.2	197	185.5	66.4	257	242.0	86.6
18	17.0	06.1	78	73.4	26.3	138	129.9	46.5	198	186.4	66.0	258	242.9	86.9
19	17.9	06.4	79	74.4	26.6	139	130.9	46.8	199	187.4	67.7	259	243.9	87.3
20	18.8	06.7	80	75.3	27.0	140	131.8	47.2	200	188.3	67.4	260	244.8	87.6
21	19.8	07.1	81	76.3	27.3	141	132.8	47.5	201	189.3	67.7	261	245.7	87.9
22	20.7	07.4	82	77.2	27.6	142	133.7	47.8	202	190.2	68.1	262	246.7	88.3
23	21.7	07.8	83	78.2	28.0	143	134.6	48.2	203	191.1	68.4	263	247.6	88.6
24	22.6	08.1	84	79.1	28.3	144	135.6	48.5	204	192.1	68.7	264	248.6	88.9
25	23.5	08.4	85	80.0	28.6	145	136.5	48.9	205	193.0	69.1	265	249.5	89.3
26	24.5	08.8	86	81.0	29.0	146	137.5	49.2	206	194.0	69.4	266	250.5	89.6
27	25.4	09.1	87	81.9	29.3	147	138.4	49.5	207	194.9	69.7	267	251.4	90.0
28	26.4	09.4	88	82.9	29.7	148	139.4	49.9	208	195.8	70.1	268	252.3	90.3
29	27.3	09.8	89	83.8	30.0	149	140.3	50.2	209	196.8	70.4	269	253.3	90.6
30	28.3	10.1	90	84.7	30.3	150	141.2	50.5	210	197.7	70.8	270	254.2	91.0
31	29.2	10.4	91	85.7	30.7	151	142.2	50.9	211	198.7	71.1	271	255.2	91.3
32	30.1	10.8	92	86.6	31.0	152	143.1	51.2	212	199.6	71.4	272	256.1	91.6
33	31.1	11.1	93	87.6	31.3	153	144.1	51.5	213	200.6	71.8	273	257.0	92.0
34	32.0	11.5	94	88.5	31.7	154	145.0	51.9	214	201.5	72.1	274	258.0	92.3
35	33.0	11.8	95	89.5	32.0	155	145.9	52.2	215	202.4	72.4	275	258.9	92.6
36	33.9	12.1	96	90.4	32.3	156	146.9	52.6	216	203.4	72.8	276	259.9	93.0
37	34.8	12.5	97	91.3	32.7	157	147.8	52.9	217	204.3	73.1	277	260.8	93.3
38	35.8	12.8	98	92.3	33.0	158	148.8	53.2	218	205.3	73.4	278	261.8	93.7
39	36.7	13.1	99	93.2	33.4	159	149.7	53.6	219	206.2	73.8	279	262.7	94.0
40	37.7	13.5	100	94.2	33.7	160	150.7	53.9	220	207.1	74.1	280	263.6	94.3
41	38.6	13.8	101	95.1	34.0	161	151.6	54.2	221	208.1	74.5	281	264.6	94.7
42	39.5	14.2	102	96.0	34.4	162	152.5	54.6	222	209.0	74.8	282	265.5	95.0
43	40.5	14.5	103	97.0	34.7	163	153.5	54.9	223	210.0	75.1	283	266.5	95.3
44	41.4	14.8	104	97.9	35.0	164	154.4	55.3	224	210.9	75.5	284	267.4	95.7
45	42.4	15.2	105	98.9	35.4	165	155.4	55.6	225	211.9	75.8	285	268.3	96.0
46	43.3	15.5	106	99.8	35.7	166	156.3	55.9	226	212.8	76.1	286	269.3	96.4
47	44.3	15.8	107	100.7	36.1	167	157.2	56.3	227	213.7	76.5	287	270.2	96.7
48	45.2	16.2	108	101.7	36.4	168	158.2	56.6	228	214.7	76.8	288	271.2	97.0
49	46.1	16.5	109	102.6	36.7	169	159.1	56.9	229	215.6	77.2	289	272.1	97.4
50	47.1	16.6	110	103.6	37.1	170	160.1	57.3	230	216.6	77.5	290	273.0	97.7
51	48.0	17.2	111	104.5	37.4	171	161.0	57.6	231	217.5	77.8	291	274.0	98.0
52	49.0	17.5	112	105.5	37.7	172	161.9	58.0	232	218.4	78.2	292	274.9	98.4
53	49.9	17.9	113	106.4	38.1	173	162.9	58.3	233	219.4	78.5	293	275.9	98.7
54	59.8	18.2	114	107.3	38.4	174	163.8	58.6	234	220.3	78.8	294	276.8	99.0
55	51.8	18.5	115	108.3	38.7	175	164.8	59.0	235	221.3	79.2	295	277.8	99.4
56	52.7	18.9	116	109.2	39.1	176	165.7	59.3	236	222.2	79.5	296	278.7	99.7
57	53.7	19.2	117	110.2	39.4	177	166.7	59.6	237	223.1	79.8	297	279.6	100.1
58	54.6	19.5	118	111.1	39.8	178	167.6	60.0	238	224.1	80.2	298	280.6	100.4
59	55.6	19.9	119	112.0	40.1	179	168.5	60.3	239	225.0	80.5	299	281.5	100.7
60	56.5	20.2	120	113.0	40.4	180	169.5	60.6	240	226.0	80.9	300	282.5	101.1
Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.

For 6¼ Points.

TABLE I.

Difference of Latitude and Departure for 2 Points.

Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.
1	00.9	00.4	61	56.4	23.3	121	111.8	46.3	181	167.2	69.3	241	222.7	92.2
2	01.9	00.8	62	57.3	23.7	122	112.7	46.7	182	168.2	69.7	242	223.6	92.6
3	02.8	01.2	63	58.2	24.1	123	113.6	47.1	183	169.1	70.0	243	224.5	93.0
4	03.7	01.5	64	59.1	24.5	124	114.6	47.5	184	170.0	70.4	244	225.4	93.4
5	04.6	01.9	65	60.1	24.9	125	115.5	47.8	185	170.9	70.8	245	226.4	93.8
6	05.5	02.3	66	61.0	25.3	126	116.4	48.2	186	171.8	71.2	246	227.3	94.1
7	06.5	02.7	67	61.9	25.6	127	117.3	48.6	187	172.8	71.6	247	228.2	94.5
8	07.4	03.1	68	62.8	26.0	128	118.3	49.0	188	173.7	71.9	248	229.1	94.9
9	08.3	03.4	69	63.8	26.4	129	119.2	49.4	189	174.6	72.3	249	230.1	95.3
10	09.2	03.8	70	64.7	26.8	130	120.1	49.8	190	175.5	72.7	250	231.0	95.6
11	10.2	04.2	71	65.6	27.2	131	121.0	50.1	191	176.5	73.1	251	231.9	96.1
12	11.1	04.6	72	66.5	27.6	132	122.0	50.5	192	177.4	73.5	252	232.8	96.4
13	12.0	05.0	73	67.4	27.9	133	122.9	50.9	193	178.3	73.9	253	233.7	96.8
14	12.9	05.4	74	68.4	28.3	134	123.8	51.3	194	179.2	74.2	254	234.7	97.2
15	13.9	05.7	75	69.3	28.7	135	124.7	51.7	195	180.2	74.6	255	235.6	97.6
16	14.8	06.1	76	70.2	29.1	136	125.7	52.0	196	181.1	75.0	256	236.5	98.0
17	15.7	06.5	77	71.1	29.5	137	126.6	52.4	197	182.0	75.4	257	237.4	98.4
18	16.6	06.9	78	72.1	29.9	138	127.5	52.8	198	182.9	75.8	258	238.4	98.7
19	17.6	07.3	79	73.0	30.2	139	128.4	53.2	199	183.9	76.2	259	239.3	99.1
20	18.5	07.7	80	73.9	30.6	140	129.3	53.6	200	184.8	76.5	260	240.2	99.5
21	19.4	08.0	81	74.8	31.0	141	130.3	54.0	201	185.7	76.9	261	241.1	99.9
22	20.3	08.4	82	75.8	31.4	142	131.2	54.3	202	186.6	77.3	262	242.1	100.3
23	21.3	08.8	83	76.7	31.8	143	132.1	54.7	203	187.6	77.7	263	243.0	100.6
24	22.2	09.2	84	77.6	32.2	144	133.0	55.1	202	188.5	78.1	264	243.9	101.0
25	23.1	09.6	85	78.5	32.5	145	134.0	55.5	205	189.4	78.5	265	244.8	101.4
26	24.0	10.0	86	79.5	32.9	146	134.9	55.9	206	190.3	78.8	266	245.8	101.8
27	24.9	10.3	87	80.4	33.3	147	135.8	56.3	207	191.2	79.2	267	246.7	102.2
28	25.9	10.7	88	81.3	33.7	148	136.7	56.6	208	192.2	79.6	268	247.6	102.6
29	26.8	11.1	89	82.2	34.1	149	137.7	57.0	209	193.1	80.0	269	248.5	102.9
30	27.7	11.5	90	83.2	34.4	150	138.6	57.4	210	194.0	80.4	270	249.5	103.3
31	28.6	11.9	91	84.1	34.8	151	139.5	57.8	211	194.9	80.8	271	250.4	103.7
32	29.6	12.3	92	85.0	35.2	152	140.4	58.2	212	195.9	81.1	272	251.3	104.1
33	30.5	12.6	93	85.9	35.6	153	141.4	58.6	213	196.8	81.5	273	252.2	104.5
34	31.4	13.0	94	86.9	36.0	154	142.3	58.9	214	197.7	81.9	274	253.1	104.9
35	32.3	13.4	95	87.8	36.4	155	143.2	59.3	215	198.6	82.3	275	254.1	105.2
36	33.3	13.8	96	88.7	36.7	156	144.1	59.7	216	199.6	82.7	276	255.0	105.6
37	34.2	14.2	97	89.6	37.1	157	145.1	60.1	217	200.5	83.0	277	255.9	106.0
38	35.1	14.5	98	90.5	37.5	158	146.0	60.5	218	201.4	83.4	278	256.8	106.4
39	36.0	14.9	99	91.5	37.9	159	146.9	60.9	219	202.3	83.8	279	257.8	106.8
40	37.0	15.3	100	92.4	38.3	160	147.8	61.2	220	203.3	84.2	280	258.7	107.2
41	37.9	15.7	101	93.3	38.7	161	148.7	61.6	221	204.2	84.6	281	259.6	107.5
42	38.8	16.1	102	94.2	39.0	162	149.7	62.0	222	205.1	85.0	282	260.5	107.9
43	39.7	16.5	103	95.2	39.4	163	150.6	62.4	223	206.0	85.3	283	261.5	108.3
44	40.6	16.8	104	96.1	39.8	164	151.5	62.8	224	207.0	85.7	284	262.4	108.7
45	41.6	17.2	105	97.0	40.2	165	152.4	63.1	225	207.9	86.1	285	263.3	109.1
46	42.5	17.6	106	97.9	40.6	166	153.4	63.5	226	208.8	86.5	286	264.2	109.5
47	43.4	18.0	107	98.8	41.0	167	154.3	63.9	227	209.7	86.9	287	265.2	109.8
48	44.4	18.4	108	99.8	41.3	168	155.2	64.3	228	210.6	87.3	288	266.1	110.2
49	45.3	18.8	109	100.7	41.7	169	156.1	64.7	229	211.6	87.6	289	267.0	110.6
50	46.2	19.1	110	101.6	42.1	170	157.1	65.1	230	212.5	88.0	290	267.9	111.0
51	47.1	19.5	111	102.6	42.5	171	158.0	65.4	231	213.4	88.4	291	268.9	111.4
52	48.0	19.9	112	103.5	42.9	172	158.9	65.8	232	214.3	88.8	292	269.8	111.7
53	49.0	20.3	113	104.4	43.2	173	159.8	66.2	233	215.3	89.2	293	270.7	112.1
54	49.9	20.7	114	105.3	43.6	174	160.8	66.6	234	216.2	89.6	294	271.6	112.5
55	50.8	21.1	115	106.3	44.0	175	161.7	67.0	235	217.1	89.9	295	272.5	112.9
56	51.7	21.4	116	107.2	44.4	176	162.6	67.4	236	218.0	90.3	296	273.5	113.3
57	52.7	21.8	117	108.1	44.8	177	163.5	67.7	237	219.0	90.7	297	274.4	113.7
58	53.6	22.2	118	109.0	45.2	178	164.5	68.1	238	219.9	91.1	298	275.3	114.0
59	54.5	22.6	119	109.9	45.5	179	165.4	68.5	239	220.8	91.5	299	276.2	114.4
60	55.4	23.0	120	110.9	45.9	180	166.3	68.9	240	221.7	91.8	300	277.2	114.8
Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.

For 6 Points.

TABLE I.

Difference of Latitude and Departure for 2¼ Points.

Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.
1	00.9	00.4	61	55.1	26.1	121	109.4	51.7	181	163.6	77.4	241	217.9	103.0
2	01.8	00.9	62	56.0	26.5	122	110.3	52.2	182	164.5	77.8	242	218.8	103.5
3	02.7	01.3	63	57.0	26.9	123	111.2	52.6	183	165.4	78.3	243	219.7	103.9
4	03.6	01.7	64	57.9	27.4	124	112.1	53.0	184	166.3	78.7	244	220.6	104.3
5	04.5	02.1	65	58.8	27.8	125	113.0	53.5	185	167.2	79.1	245	221.5	104.8
6	05.4	02.6	66	59.7	28.2	126	113.9	53.9	186	168.1	79.5	246	222.4	105.2
7	06.3	03.0	67	60.6	28.7	127	114.8	54.3	187	169.0	80.0	247	223.3	105.6
8	07.2	03.4	68	61.5	29.1	128	115.7	54.7	188	169.9	80.4	248	224.2	106.1
9	08.1	03.8	69	62.4	29.5	129	116.6	55.2	189	170.9	80.8	249	225.1	106.5
10	09.0	04.3	70	63.3	29.9	130	117.5	55.6	190	171.8	81.3	250	226.0	106.9
11	09.9	04.7	71	64.2	30.4	131	118.4	56.0	191	172.7	81.7	251	226.9	107.3
12	10.8	05.1	72	65.1	30.8	132	119.3	56.5	192	173.6	82.1	252	227.8	107.8
13	11.8	05.6	73	66.0	31.2	133	120.2	56.9	193	174.5	82.5	253	228.7	108.2
14	12.7	06.0	74	66.9	31.6	134	121.1	57.3	194	175.4	83.0	254	229.6	108.6
15	13.6	06.4	75	67.8	32.1	135	122.0	57.7	195	176.3	83.4	255	230.5	109.0
16	14.5	06.8	76	68.7	32.5	136	122.9	58.2	196	177.2	83.8	256	231.4	109.5
17	15.4	07.3	77	69.6	32.9	137	123.8	58.6	167	178.1	84.2	257	232.3	109.9
18	16.3	07.7	78	70.5	33.4	138	124.7	59.0	198	179.0	84.7	258	233.2	110.3
19	17.2	08.1	79	71.4	33.8	139	125.7	59.4	199	179.9	85.1	259	234.1	110.8
20	18.1	08.6	80	72.3	34.2	140	126.6	59.9	200	180.8	85.5	260	235.0	111.2
21	19.0	09.0	81	73.2	34.6	141	127.5	60.3	201	181.7	85.9	261	235.9	111.6
22	19.9	09.4	82	74.1	35.1	142	128.4	60.7	202	182.6	86.4	262	236.8	112.0
23	20.8	09.8	83	75.0	35.5	143	129.3	61.2	203	183.5	86.8	263	237.7	112.5
24	21.7	10.3	84	75.9	35.9	144	130.2	61.6	204	184.4	87.2	264	238.7	112.9
25	22.6	10.7	85	76.8	36.3	145	131.1	62.0	205	185.3	87.7	265	239.6	113.3
26	23.5	11.1	86	77.7	36.8	146	132.0	62.4	206	186.2	88.1	266	240.5	113.7
27	24.4	11.5	87	78.7	37.2	147	132.9	62.9	207	187.1	88.5	267	241.4	114.2
28	25.3	12.0	88	79.6	37.6	148	133.8	63.3	208	188.0	88.9	268	242.3	114.6
29	26.2	12.4	89	80.5	38.1	149	134.7	63.7	209	188.9	89.4	269	243.2	115.0
30	27.1	12.8	90	81.4	38.5	150	135.6	64.1	210	189.8	89.8	270	244.1	115.5
31	28.0	13.3	91	82.3	38.9	151	136.5	64.6	211	190.7	90.2	271	245.0	115.9
32	28.9	13.7	92	83.2	39.3	152	137.4	65.0	212	191.6	90.7	272	245.9	116.3
33	29.8	14.1	93	84.1	39.8	153	138.3	65.4	213	192.6	91.1	273	246.8	116.7
34	30.7	14.5	94	85.0	40.2	154	139.2	65.9	214	193.5	91.5	274	247.7	117.2
35	31.6	15.0	95	85.9	40.6	155	140.1	66.3	215	994.4	91.9	275	248.6	117.6
36	32.5	15.4	96	86.8	41.1	156	141.0	66.7	216	195.3	92.4	276	249.5	118.0
37	33.4	15.8	97	87.7	41.5	157	141.9	67.1	217	196.2	92.8	277	250.4	118.5
38	34.4	16.3	98	88.6	41.9	158	142.8	67.6	218	197.1	93.2	278	251.3	118.9
39	35.3	16.7	99	89.5	42.3	159	143.7	68.0	219	198.0	93.7	279	252.2	119.3
40	36.2	17.1	100	90.4	42.8	160	144.6	68.4	220	198.9	94.1	280	253.1	119.7
41	37.1	17.5	101	91.3	43.2	161	145.5	68.8	221	199.8	94.5	281	254.0	120.2
42	38.0	18.0	102	92.2	43.6	162	146.4	69.3	222	200.7	94.9	282	254.9	120.6
43	38.9	18.4	103	93.1	44.1	163	147.3	69.7	223	201.6	95.4	283	255.8	121.0
44	39.8	18.8	104	94.0	44.5	164	148.3	70.1	224	202.5	95.8	284	256.7	121.5
45	40.7	19.2	105	94.9	44.9	165	149.2	70.6	225	203.4	96.2	285	257.6	121.9
46	41.6	19.7	106	95.8	45.3	166	150.1	71.0	226	204.3	96.6	286	258.5	122.3
47	42.5	20.1	107	96.7	45.8	167	151.0	71.4	227	205.2	97.1	287	259.4	122.7
48	43.4	20.5	108	97.6	46.2	168	151.9	71.8	228	206.1	97.5	288	260.3	123.2
49	44.3	21.0	109	98.5	46.6	169	152.8	72.3	229	207.0	97.9	289	261.3	123.6
50	45.2	21.4	110	99.4	47.0	170	153.7	72.7	230	207.9	98.4	290	262.2	124.0
51	46.1	21.8	111	100.3	47.5	171	154.6	73.1	231	208.8	98.8	291	263.1	124.4
52	47.0	22.2	112	101.2	47.9	172	155.5	73.6	232	209.7	99.2	292	264.0	124.9
53	47.9	22.7	113	102.2	48.3	173	156.4	74.0	233	210.6	99.6	293	264.9	125.3
54	48.8	23.1	114	103.1	48.7	174	157.3	74.4	234	211.5	100.1	294	265.8	125.7
55	49.7	23.5	115	104.0	49.2	175	158.2	74.8	235	212.4	100.5	295	266.7	126.2
56	50.6	23.9	116	104.9	49.6	176	159.1	75.3	236	213.3	100.9	296	267.6	126.6
57	51.5	24.4	117	105.8	50.0	177	160.0	75.7	237	214.2	101.4	297	268.5	127.0
58	52.4	24.8	118	106.7	50.5	178	160.9	76.1	238	215.1	101.8	298	269.4	127.4
59	53.3	25.2	119	107.6	50.9	179	161.8	76.5	239	216.1	102.2	299	270.3	127.9
60	51.2	25.7	120	108.5	51.3	180	162.7	77.0	240	217.0	102.6	300	271.2	128.3
Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.

For 5¾ Points.

TABLE I.

Difference of Latitude and Departure for 2½ Points.

Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.
1	00.9	00.5	61	53.8	28.8	121	106.7	57.0	181	159.6	85.3	241	212.5	113.6
2	01.8	00.9	62	54.7	29.2	122	107.6	57.5	182	160.5	85.8	242	213.4	114.1
3	02.6	01.4	63	55.6	29.7	123	108.5	58.0	183	161.4	86.3	243	214.3	114.6
4	03.5	01.9	64	56.4	30.2	124	109.4	58.4	184	162.3	86.7	244	215.2	115.0
5	04.4	02.4	65	57.3	30.6	125	110.2	58.9	185	163.2	87.2	245	216.1	115.5
6	05.3	02.8	66	58.2	31.1	126	111.1	59.4	186	164.0	87.7	246	217.0	116.0
7	06.2	03.3	67	59.1	31.6	127	112.0	59.9	187	164.9	88.1	247	217.8	116.4
8	07.1	03.8	68	60.0	32.1	128	112.9	60.3	188	165.8	88.6	248	218.7	116.9
9	07.9	04.2	69	60.9	32.5	129	113.8	60.8	189	166.7	89.1	249	219.6	117.4
10	08.8	04.7	70	61.7	33.0	130	114.7	61.3	190	167.6	89.6	250	220.5	117.8
11	09.7	05.2	71	62.6	33.5	131	115.5	61.7	191	168.5	90.0	251	221.4	118.3
12	10.6	05.7	72	63.5	33.9	132	116.4	62.2	192	169.3	90.5	252	222.2	118.8
13	11.5	06.1	73	64.4	34.4	133	117.3	62.7	193	170.2	91.0	253	223.1	119.3
14	12.3	06.6	74	65.3	34.9	134	118.2	63.2	194	171.1	91.4	254	224.0	119.7
15	13.2	07.1	75	66.1	35.4	135	119.1	63.6	195	172.0	91.9	255	224.9	120.2
16	14.1	07.5	76	67.0	35.8	136	119.9	64.1	196	172.9	92.4	256	225.8	120.7
17	15.0	08.0	77	67.9	36.3	137	120.8	64.6	197	173.7	92.9	257	226.7	121.1
18	15.9	08.5	78	68.8	36.8	138	121.7	65.0	198	174.6	93.3	258	227.5	121.6
19	16.8	09.0	79	69.7	37.2	139	122.6	65.5	199	175.5	93.8	259	228.4	122.1
20	17.6	09.4	80	70.6	37.7	140	123.5	66.0	200	176.4	94.3	260	229.3	122.6
21	18.5	09.9	81	71.4	38.2	141	124.4	66.5	201	177.3	94.7	261	230.2	123.0
22	19.4	10.4	82	72.3	38.6	142	125.2	66.9	202	178.2	95.2	262	231.1	123.5
23	20.3	10.8	83	73.2	39.1	143	126.1	67.4	203	179.0	95.7	263	231.9	124.0
24	21.2	11.3	84	74.1	39.6	144	127.0	67.9	204	179.9	96.2	264	232.8	124.4
25	22.1	11.8	85	75.0	40.1	145	127.9	68.3	205	180.8	96.6	265	233.7	124.9
26	22.9	12.3	86	75.9	40.5	146	128.8	68.8	206	181.7	97.1	266	234.6	125.4
27	23.8	12.7	87	76.7	41.0	147	129.6	69.3	207	182.6	97.6	267	235.5	125.9
28	24.7	13.2	88	77.6	41.5	148	130.5	69.8	208	183.4	98.0	268	236.4	126.3
29	25.6	13.7	89	78.5	41.9	149	131.4	70.2	209	184.3	98.5	269	237.2	126.8
30	26.5	14.1	90	79.4	42.4	150	132.3	70.7	210	185.2	99.0	270	238.1	127.3
31	27.3	14.6	91	80.3	42.9	151	133.2	71.2	211	186.1	99.5	271	239.0	127.7
32	28.2	15.1	92	81.1	43.4	152	134.1	71.6	212	187.0	99.9	272	239.9	128.2
33	29.1	15.6	93	82.0	43.8	153	134.9	72.1	213	187.8	100.4	273	240.8	128.7
34	30.0	16.0	94	82.9	44.3	154	135.8	72.6	214	188.7	100.9	274	241.7	129.2
35	30.9	16.5	95	83.8	44.8	155	136.7	73.1	215	189.6	101.3	275	242.5	129.6
36	31.8	17.0	96	84.7	45.2	156	137.6	73.5	216	190.5	101.8	276	243.4	130.1
37	32.6	17.4	97	85.6	45.7	157	138.5	74.0	217	191.4	102.3	277	244.3	130.6
38	33.5	17.9	98	86.4	46.2	158	139.3	74.5	218	192.3	102.8	278	245.2	131.0
39	34.4	18.4	99	87.3	46.7	159	140.2	74.9	219	193.1	103.2	279	246.1	131.5
40	35.3	18.9	100	88.2	47.1	160	141.1	75.4	220	194.0	103.7	280	246.9	132.0
41	36.2	19.3	101	89.1	47.6	161	142.0	75.9	221	194.9	104.2	281	247.8	132.5
42	37.0	19.8	102	90.0	48.1	162	142.9	76.4	222	195.8	104.6	282	248.7	132.9
43	37.9	20.3	103	90.8	48.5	163	143.8	76.8	223	196.7	105.1	283	249.6	133.4
44	38.8	20.7	104	91.7	49.0	164	144.6	77.3	224	197.6	105.6	284	250.5	133.9
45	39.7	21.2	105	92.6	49.5	165	145.5	77.8	225	198.4	106.1	285	251.4	134.3
46	40.6	21.7	106	93.5	50.0	166	146.4	78.2	226	199.3	106.5	286	252.2	134.8
47	41.5	22.2	107	94.4	50.4	167	147.3	78.7	227	200.2	107.0	287	253.1	135.3
48	42.3	22.6	108	95.3	50.9	168	148.2	79.2	228	201.1	107.5	288	254.0	135.8
49	43.2	23.1	109	96.1	51.4	169	149.0	79.7	229	202.0	107.9	289	254.9	136.2
50	44.1	23.6	110	97.0	51.8	170	149.9	80.1	230	202.8	108.4	290	255.8	136.7
51	45.0	24.0	111	97.9	52.3	171	150.8	80.6	231	203.7	108.9	291	256.6	137.2
52	45.9	24.5	112	98.8	52.8	172	151.7	81.1	232	204.6	109.4	292	257.5	137.6
53	46.7	25.0	113	99.7	53.3	173	152.6	81.5	233	205.5	109.8	293	258.4	138.1
54	47.6	25.5	114	100.5	53.7	174	153.5	82.0	234	206.4	110.3	294	259.3	138.6
55	48.5	25.9	115	101.4	54.2	175	154.3	82.5	235	207.3	110.8	295	260.2	139.1
56	49.4	26.4	116	102.3	54.7	176	155.2	83.0	236	208.1	111.2	296	261.1	139.5
57	50.3	26.9	117	103.2	55.1	177	156.1	83.4	237	209.0	111.7	297	261.9	140.0
58	51.2	27.3	118	104.1	55.6	178	157.0	83.9	238	209.9	112.2	298	262.8	140.5
59	52.0	27.8	119	105.0	56.1	179	157.9	84.4	239	210.8	112.7	299	263.7	140.9
60	52.9	28.3	120	105.8	56.6	180	158.8	84.8	240	211.7	113.1	300	264.6	141.4
Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.

For 5½ Points.

TABLE I.

Difference of Latitude and Departure for 2¾ Points.

Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat·	Dep.	Dist	Lat.	Dep.
1	00.9	00.5	61	52.3	31.4	121	103.8	62.2	181	155.3	93.0	241	206.7	123.9
2	01.7	01.0	62	53.2	31.9	122	104.6	62.7	182	156.1	93.6	242	207.6	124.4
3	02.6	01.5	63	54.0	32.4	123	105.5	63.2	183	157.0	94.1	243	208.4	124.9
4	03.4	02.1	64	54.9	32.9	124	106.4	63.7	184	157.8	94.6	244	209.3	125.4
5	04.3	02.6	65	55.8	33.4	125	107.2	64.3	185	158.7	95.1	245	210.1	125.9
6	05.1	03.1	66	56.6	33.9	126	108.1	64.8	186	159.5	95.6	246	211.0	126.5
7	06.0	03.6	67	57.5	34.4	127	108.9	65.3	187	160.4	96.1	247	211.9	127.0
8	06.9	04.1	68	58.3	35.0	128	109.8	65.8	188	161.2	96.6	248	212.7	127.5
9	07.7	04.6	69	59.2	35.5	129	110.6	66.3	189	162.1	97.2	249	213.6	128.0
10	08.6	05.1	70	60.0	36.0	130	111.5	66.8	190	163.0	97.7	250	214.4	128.5
11	09.4	05.7	71	60.9	36.5	131	112.4	67.3	191	163.8	98.2	251	215.3	129.0
12	10.3	06.2	72	61.8	37.0	132	113.2	67.9	192	164.7	98.7	252	216.1	129.5
13	11.2	06.7	73	62.6	37.5	133	114.1	68.4	193	165.5	99.2	253	217.0	130.1
14	12.0	07.2	74	63.5	38.0	134	114.9	68.9	194	166.4	99.7	254	217.9	130.6
15	12.9	07.7	75	64.3	38.6	135	115.8	69.4	195	167.3	100.2	255	218.7	131.1
16	13.7	08.2	76	65.2	39.1	136	116.6	69.9	196	168.1	100.8	256	219.6	131.6
17	14.6	08.7	77	66.0	39.6	137	117.5	70.4	197	169.0	101.3	257	220.4	132.1
18	15.4	09.3	78	66.9	40.1	138	118.4	70.9	198	169.8	101.8	258	221.3	132.6
19	16.3	09.8	79	67.8	40.6	139	119.2	71.5	199	170.7	102.3	259	222.2	133.1
20	17.2	10.3	80	68.6	41.1	140	120.1	72.0	200	171.5	102.8	260	223.0	133.7
21	18.0	10.8	81	69.5	41.6	141	120.9	72.5	201	172.4	103.3	261	223.9	134.2
22	18.9	11.3	82	70.3	42.1	142	121.8	73.0	202	173.3	103.8	262	224.7	134.7
23	19.7	11.8	83	71.2	42.7	143	122.7	73.5	203	174.1	104.4	263	225.6	135.2
24	20.6	12.3	84	72.0	43.2	144	123.5	74.0	204	175.0	104.9	264	226.4	135.7
25	21.4	12.9	85	72.9	43.7	145	124.4	74.5	205	175.8	105.4	265	227.3	136.2
26	22.3	13.4	86	73.8	44.2	146	125.2	75.1	206	176.7	105.9	266	228.2	136.7
27	23.2	13.9	87	74.6	44.7	147	126.1	75.6	207	177.5	106.4	267	229.0	137.3
28	24.0	14.4	88	75.5	45.2	148	126.9	76.1	208	178.4	106.9	268	229.9	137.8
29	24.9	14.9	89	76.3	45.7	149	127.8	76.6	209	179.3	107.4	269	230.7	138.3
30	25.7	15.4	90	77.2	46.3	150	128.7	77.1	210	180.1	108.0	270	231.6	138.8
31	26.6	15.9	91	78.1	46.8	151	129.5	77.6	211	181.0	108.5	271	232.4	139.3
32	27.4	16.5	92	78.9	47.3	152	130.4	78.1	212	181.8	109.0	272	233.3	139.8
33	28.3	17.0	93	79.8	47.8	153	131.2	78.7	213	182.7	109.5	273	234.2	140.3
34	29.2	17.5	94	80.6	48.3	154	132.1	79.2	214	183.5	110.0	274	235.0	140.9
35	30.0	18.0	95	81.5	48.8	155	132.9	79.7	215	184.4	110.5	275	235.9	141.4
36	30.9	18.5	96	82.3	49.3	156	133.8	80.2	216	185.3	111.0	276	236.7	141.9
37	31.7	19.0	97	83.2	49.9	157	134.7	80.7	217	186.1	111.6	277	237.6	142.4
38	32.6	19.5	98	84.1	50.4	158	135.5	81.2	218	187.0	112.1	278	238.4	142.9
39	33.5	20.1	99	84.9	50.9	159	136.4	81.7	219	187.8	112.6	279	239.3	143.4
40	34.3	20.6	100	85.8	51.4	160	137.2	82.3	220	188.7	113.1	280	240.2	143.9
41	35.2	21.1	101	86.6	51.9	161	138.1	82.8	221	189.6	113.6	281	241.0	144.5
42	36.0	21.6	102	87.5	52.4	162	138.9	83.3	222	190.4	114.1	282	241.9	145.0
43	36.9	22.1	103	88.3	52.9	163	139.8	83.8	223	191.3	114.6	283	242.7	145.5
44	37.7	22.6	104	89.2	53.5	164	140.7	84.3	224	192.1	115.2	284	243.6	146.0
45	38.6	23.1	105	90.1	54.0	165	141.5	84.8	225	193.0	115.7	285	244.4	146.5
46	39.5	23.6	106	90.9	54.5	166	142.4	85.3	226	193.8	116.2	286	245.3	147.0
47	40.3	24.2	107	91.8	55.0	167	143.2	85.8	227	194.7	116.7	287	246.2	147.5
48	41.2	24.7	108	92.6	55.5	168	144.1	86.4	228	195.6	117.2	288	247.0	148.1
49	42.0	25.2	109	93.5	56.0	169	145.0	86.9	229	196.4	117.7	289	247.9	148.6
50	42.9	25.7	110	94.3	56.5	170	145.8	87.4	230	197.3	118.2	290	248.7	149.1
51	43.7	26.2	111	95.2	57.1	171	146.7	87.9	231	198.1	118.8	291	249.6	149.6
52	44.6	26.7	112	96.1	57.6	172	147.5	88.4	232	199.0	119.3	292	250.5	150.1
53	45.5	27.2	113	96.9	58.1	173	148.4	88.9	233	199.8	119.8	293	251.3	150.6
54	46.3	27.8	114	97.8	58.6	174	149.2	89.4	234	200.7	120.3	294	252.2	151.1
55	47.2	28.3	115	98.6	59.1	175	150.1	90.0	235	201.6	120.8	295	253.0	151.7
56	48.0	28.8	116	99.5	59.6	176	151.0	90.5	236	202.4	121.3	296	253.9	152.2
57	48.9	29.3	117	100.4	60.1	177	151.8	91.0	237	203.3	121.8	297	254.7	152.7
58	49.7	29.8	118	101.2	60.7	178	152.7	91.5	238	204.1	122.4	298	255.6	153.2
59	50.6	30.3	119	102.1	61.2	179	153.5	92.0	239	205.0	122.9	299	256.5	153.7
60	51.5	30.8	120	102.9	61.7	180	154.4	92.5	240	205.9	123.4	300	257.3	154.2
Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.

For 5¼ Points.

TABLE I.

Difference of Latitude and Departure for 3 Points.

Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat	Dep.	Dist	Lat.	Dep.
1	00.8	00.6	61	50.7	33.9	121	100.6	67.2	181	150.5	100.6	241	200.4	133.9
2	01.7	01.1	62	51.5	34.4	122	101.4	67.8	182	151.3	101.1	242	201.2	134.4
3	02.5	01.7	63	52.4	35.0	123	102.3	68.3	183	152.2	101.7	243	202.0	135.0
4	03.3	02.2	64	53.2	35.6	124	103.1	68.9	184	153.0	102.2	244	202.9	135.6
5	04.2	02.8	65	54.0	36.1	125	103.9	69.4	185	153.8	102.8	245	203.7	136.1
6	05.0	03.3	66	54.9	36.7	126	104.8	70.0	186	154.6	103.3	246	204.5	136.7
7	05.8	03.9	67	55.7	37.2	127	105.6	70.6	187	155.5	103.9	247	205.4	137.2
8	06.7	04.4	68	56.5	37.8	128	106.4	71.1	188	156.3	104.4	248	206.2	137.8
9	07.5	05.0	69	57.4	38.3	129	107.3	71.7	189	157.1	105.0	249	207.0	138.3
10	08.3	05.6	70	58.2	38.9	130	108.1	72.2	190	158.0	105.6	250	207.9	138.9
11	09.1	06.1	71	59.0	39.4	131	108.9	72.8	191	158.8	106.1	251	208.7	139.4
12	10.0	06.7	72	59.9	40.0	132	109.7	73.3	192	159.6	106.7	252	209.5	140.0
13	10.8	07.2	73	60.7	40.6	133	110.6	73.9	193	160.5	107.2	253	210.4	140.6
14	11.6	07.8	74	61.5	41.1	134	111.4	74.4	194	161.3	107.8	254	211.2	141.1
15	12.5	08.3	75	62.4	41.7	135	112.2	75.0	195	162.1	108.3	255	212.0	141.7
16	13.3	08.9	76	63.2	42.2	136	113.1	75.6	196	163.0	108.9	256	212.9	142.2
17	14.1	09.4	77	64.0	42.8	137	113.9	76.1	197	163.8	109.4	257	213.7	142.8
18	15.0	10.0	78	64.8	43.3	138	114.7	76.7	198	164.6	110.0	258	214.5	143.3
19	15.8	10.6	79	65.7	43.9	139	115.6	77.2	199	165.5	110.6	259	215.3	143.9
20	16.6	11.1	80	66.5	44.4	140	116.4	77.8	200	166.3	111.1	260	216.2	144.4
21	17.5	11.7	81	67.3	45.0	141	117.2	78.3	201	167.1	111.7	261	217.0	145.0
22	18.3	12.2	82	68.2	45.6	142	118.1	78.9	202	168.0	112.2	262	217.8	145.6
23	19.1	12.8	83	69.0	46.1	143	118.9	79.4	203	168.8	112.8	263	218.7	146.1
24	20.0	13.3	84	69.8	46.7	144	119.7	80.0	204	169.6	113.3	264	219.5	146.7
25	20.8	13.9	85	70.7	47.2	145	120.6	80.6	205	170.4	113.9	265	220.3	147.2
26	21.6	14.4	86	71.5	47.8	146	121.4	81.1	206	171.3	114.4	266	221.2	147.8
27	22.4	15.0	87	72.3	48.3	147	122.2	81.7	207	172.1	115.0	267	222.0	148.3
28	23.3	15.6	88	73.2	48.9	148	123.1	82.2	208	172.9	115.6	268	222.8	148.9
29	24.1	16.1	89	74.0	49.4	149	123.9	82.8	209	173.8	116.1	269	223.7	149.4
30	24.9	16.7	90	74.8	50.0	150	124.7	83.3	210	174.6	116.7	270	224.5	150.0
31	25.8	17.2	91	75.7	50.6	151	125.5	83.9	211	175.4	117.2	271	225.3	150.6
32	26.6	17.8	92	76.5	51.1	152	126.4	84.4	212	176.3	117.8	272	226.2	151.1
33	27.4	18.3	93	77.3	51.7	153	127.2	85.0	213	177.1	118.3	273	227.0	151.7
34	28.3	18.9	94	78.2	52.2	154	128.0	85.6	214	177.9	118.9	274	227.8	152.2
35	29.1	19.4	95	79.0	52.8	155	128.9	86.1	215	178.8	119.4	275	228.6	152.8
36	29.9	20.0	96	79.8	53.3	156	129.7	86.7	216	179.6	120.0	276	229.5	153.3
37	30.8	20.6	97	80.6	53.9	157	130.5	87.2	217	180.4	120.6	277	230.3	153.9
38	31.6	21.1	98	81.5	54.4	158	131.4	87.8	218	181.3	121.1	278	231.1	154·4
39	32.4	21.7	99	82.3	55.0	159	132.2	88.3	219	182.1	121.7	279	232.0	155.0
40	33.3	22.2	100	83.1	55.6	160	133.0	88.9	220	182.9	122.2	280	232.8	155.6
41	34.1	22.8	101	84.0	56.1	161	133.9	89.4	221	183.7	122.8	281	233.6	156.1
42	34.9	23.3	102	84.8	56.7	162	134.7	90.0	222	184.6	123.3	282	234.5	156.7
43	35.8	23.9	103	85.6	57.2	163	135.5	90.6	223	185.4	123.9	283	235.3	157.2
44	36.6	24.4	104	86.5	57.8	164	136.4	91.1	224	186.2	124.4	284	236.1	157.8
45	37.4	25.0	105	87.3	58.3	165	137.2	91.7	225	187.1	125.0	285	237.0	158.3
46	38.2	25.6	106	88.1	58.9	166	138.0	92.2	226	187.9	125.6	286	237.8	158.9
47	39.1	26.1	107	89.0	59.4	167	138.9	92.8	227	188.7	126.1	287	238.6	159.4
48	39.9	26.7	108	89.8	60.0	168	139.7	93.3	228	189.6	126.7	288	239.5	160.0
49	40.7	27.2	109	90.6	60.6	169	140.5	93.9	229	190.4	127.2	289	240.3	160.6
50	41.6	27.8	110	91.5	61.1	170	141.3	94.4	230	191.2	127.8	290	241.1	161.1
51	42.4	28.3	111	92.3	61.7	171	142.2	95.0	231	192.1	128.3	291	242.0	161.7
52	43.2	28.9	112	93.1	62.2	172	143.0	95.6	232	192.9	128.9	292	242.8	162.2
53	44.1	29.4	113	94.0	62.8	173	143.8	96.1	233	193.7	129.4	293	243.6	162.8
54	44.9	30.0	114	94.8	63.3	174	144.7	96.7	234	194.6	130.0	294	244.4	163.3
55	45.7	30.6	115	95.6	63.9	175	145.5	97.2	235	195.4	130.6	295	245.3	163.9
56	46.6	31.1	116	96.4	64.4	176	146.3	97.8	236	196.2	131.1	296	246.1	164.4
57	47.4	31.7	117	97.3	65.0	177	147.2	98.3	237	197.1	131.7	297	246.9	165.0
58	48.2	32.2	118	98.1	65.6	178	148.0	98.9	238	197.9	132.2	298	247.8	165.6
59	49.1	32.8	119	98.9	66.1	179	148.8	99.4	239	198.7	132.8	299	248.6	166.1
60	49.9	33.3	120	99.8	66.7	180	149.7	100.0	240	199.5	133.3	300	249.4	166.7
Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.

For 5 Points.

TABLE I.

Difference of Latitude and Departure for 3¼ Point.

Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.
1	00.8	00.6	61	49.0	36.3	121	97.2	72.1	181	145.4	107.8	241	193.6	143.6
2	01.6	01.2	62	49.8	36.9	122	98.0	72.7	182	146.2	108.4	242	194.4	144.2
3	02.4	01.8	63	50.6	37.5	123	98.8	73.3	183	147.0	109.0	243	195.2	144.8
4	03.2	02.4	64	51.4	38.1	124	99.6	73.9	184	147.8	109.6	244	196.0	145.4
5	04.0	03.0	65	52.2	38.7	125	100.4	74.5	185	148.6	110.2	245	196.8	146.0
6	04.8	03.6	66	53.0	39.3	126	101.2	75.1	186	149.4	110.8	246	197.6	146.5
7	05.6	04.2	67	53.8	39.9	127	102.0	75.7	187	150.2	111.4	247	198.4	147.1
8	06.4	04.8	68	54.6	40.5	128	102.8	76.3	188	151.0	112.0	248	199.2	147.7
9	07.2	05.4	69	55.4	41.1	129	103.6	76.9	189	151.8	112.6	249	200.0	148.3
10	08.0	06.0	70	56.2	41.7	130	104.4	77.4	190	152.6	113.2	250	200.8	148.9
11	08.8	06.6	71	57.0	42.3	131	105.2	78.0	191	153.4	113.8	251	201.6	149.5
12	09.6	07.1	72	57.8	42.9	132	106.0	78.6	192	154.2	114.4	252	202.4	150.1
13	10.4	07.7	73	58.6	43.5	133	106.8	79.2	193	155.0	115.0	253	203.2	150.7
14	11.2	08.3	74	59.4	44.1	134	107.6	79.8	194	155.8	115.6	254	204.0	151.3
15	12.0	08.9	75	60.2	44.7	135	108.4	80.4	195	156.6	116.2	255	204.8	151.9
16	12.9	09.5	76	61.0	45.3	136	109.2	81.0	196	157.4	116.8	256	205.6	152.5
17	13.7	10.1	77	61.8	45.9	137	110.0	81.6	197	158.2	117.4	257	206.4	153.1
18	14.5	10.7	78	62.6	46.5	138	110.8	82.2	198	159.0	118.0	258	207.2	153.7
19	15.3	11.3	79	63.4	47.1	139	111.6	82.8	199	159.8	118.5	259	208.0	154.3
20	16.1	11.9	80	64.3	47.7	140	112.4	83.4	200	160.6	119.1	260	208.8	154.9
21	16.9	12.5	81	65.1	48.3	141	113.2	84.0	201	161.4	119.7	261	209.6	155.5
22	17.7	13.1	82	65.9	48.9	142	114.0	84.6	202	162.2	120.3	262	210.4	156.1
23	18.5	13.7	83	66.7	49.4	143	114.9	85.2	203	163.0	120.9	263	211.2	156.7
24	19.3	14.3	84	67.5	50.0	144	115.7	85.8	204	163.9	121.5	264	212.0	157.3
25	20.1	14.9	85	68.3	50.6	145	116.5	86.4	205	164.7	122.1	265	212.8	157.9
26	20.9	15.5	86	69.1	51.2	146	117.3	87.0	206	165.5	122.7	266	213.6	158.5
27	21.7	16.1	87	69.9	51.8	147	118.1	87.6	207	166.3	123.3	267	214.5	159.1
28	22.5	16.7	88	70.7	52.4	148	118.9	88.2	208	167.1	123.9	268	215.3	159.6
29	23.3	17.3	89	71.5	53.0	149	119.7	88.8	209	167.9	124.5	269	216.1	160.2
30	24.1	17.9	90	72.3	53.6	150	120.5	89.4	210	168.7	125.1	270	216.9	160.8
31	24.9	18.5	91	73.1	54.2	151	121.3	90.0	211	169.5	125.7	271	217.7	161.4
32	25.7	19.1	92	73.9	54.8	152	122.1	90.5	212	170.3	126.3	272	218.5	162.0
33	26.5	19.7	93	74.7	55.4	153	122.9	91.1	213	171.1	126.9	273	219.3	162.6
34	27.3	20.3	94	75.5	56.0	154	123.7	91.7	214	171.9	127.5	274	220.1	163.2
35	28.1	20.9	95	76.3	56.6	155	124.5	92.3	215	172.7	128.1	275	220.9	163.8
36	28.9	21.4	96	77.1	57.2	156	125.3	92.9	216	173.5	128.7	276	221.7	164.4
37	29.7	22.0	97	77.9	57.8	157	126.1	93.5	217	174.3	129.3	277	222.5	165.0
38	30.5	22.6	98	78.7	58.4	158	126.9	94.1	218	175.1	129.9	278	223.3	165.6
39	31.3	23.2	99	79.5	59.0	159	127.7	94.7	219	175.9	130.5	279	224.1	166.2
40	32.1	23.8	100	80.3	59.6	160	128.5	95.3	220	176.7	131.1	280	224.9	166.8
41	32.9	24.4	101	81.1	60.2	161	129.3	95.9	221	177.5	131.7	281	225.7	167.4
42	33.7	25.0	102	81.9	60.8	162	130.1	96.5	222	178.3	132.2	282	226.5	168.0
43	34.5	25.6	103	82.7	61.4	163	130.9	97.1	223	179.1	132.8	283	227.3	168.6
44	35.3	26.2	104	83.5	62.0	164	131.7	97.7	224	179.9	133.4	284	228.1	169.2
45	36.1	26.8	105	84.3	62.6	165	132.5	98.3	225	180.7	134.0	285	228.9	169.8
46	36.9	27.4	106	85.1	63.1	166	133.3	98.9	226	181.5	134.6	286	229.7	170.4
47	37.7	28.0	107	85.9	63.7	167	134.1	99.5	227	182.3	135.2	287	230.5	171.0
48	38.6	28.6	108	86.7	64.3	168	134.9	100.1	228	183.1	135.8	288	231.3	171.6
49	39.4	29.2	109	87.5	64.9	169	135.7	100.7	229	183.9	136.4	289	232.1	172.2
50	40.2	29.8	110	88.4	65.5	170	136.5	101.3	230	184.7	137.0	290	232.9	172.8
51	41.0	30.4	111	89.2	66.1	171	137.3	101.9	231	185.5	137.6	291	233.7	173.3
52	41.8	31.0	112	90.0	66.7	172	138.1	102.5	232	186.3	138.2	292	234.5	173.9
53	42.6	31.6	113	90.8	67.3	173	138.9	103.1	233	187.1	138.8	293	235.3	174.5
54	43.4	32.2	114	91.6	67.9	174	139.8	103.7	234	187.9	139.4	294	236.1	175.1
55	44.2	32.8	115	92.4	68.5	175	140.6	104.2	235	188.8	140.0	295	236.9	175.7
56	45.0	33.4	116	93.2	69.1	176	141.4	104.8	236	189.6	140.6	296	237.7	176.3
57	45.8	34.0	117	94.0	69.7	177	142.2	105.4	237	190.4	141.2	297	238.5	176.9
58	46.6	34.6	118	94.8	70.3	178	143.0	106.0	238	191.2	141.8	298	239.4	177.5
59	47.4	35.1	119	95.6	70.9	179	143.8	106.6	239	192.0	142.4	299	240.2	178.1
60	48.2	35.7	120	96.4	71.5	180	144.6	107.2	240	192.8	143.0	300	241.0	178.7
Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.

For 4¾ Points.

TABLE I.

Difference of Latitude and Departure for 3½ Point.

Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.
1	00.8	00.6	61	47.1	38.7	121	93.5	76.8	181	139.9	114.8	241	186.3	152.9
2	01.5	01.3	62	47.9	39.3	122	94.3	77.4	182	140.7	115.5	242	187.1	153.5
3	02.3	01.9	63	48.7	40.0	123	95.1	78.0	183	141.5	116.1	243	187.8	154.2
4	03.1	02.5	64	49.5	40.6	124	95.8	78.7	184	142.2	116.7	244	188.6	154.8
5	03.9	03.2	65	50.2	41.2	125	96.6	79.3	185	143.0	117.4	245	189.4	155.4
6	04.6	03.8	66	51.0	41.9	126	97.4	79.9	186	143.8	118.0	246	190.2	156.1
7	05.4	04.4	67	51.8	42.5	127	98.2	80.6	187	144.5	118.6	247	190.9	156.7
8	06.2	05.1	68	52.6	43.1	128	98.9	81.2	188	145.3	119.3	248	191.7	157.3
9	07.0	05.7	69	53.3	43.8	129	99.7	81.8	189	146.1	119.9	249	192.5	158.0
10	07.7	06.3	70	54.1	44.4	130	100.5	82.5	190	146.9	120.5	250	193.2	158.6
11	08.5	07.0	71	54.0	45.0	131	101.3	83.1	191	147.6	121.2	251	194.0	159.2
12	09.3	07.6	72	55.7	45.7	132	102.0	83.7	192	148.4	121.8	252	194.8	159.9
13	10.0	08.2	73	56.4	46.3	133	102.8	84.4	193	149.2	122.4	253	195.6	160.5
14	10.8	08.9	74	57.2	46.9	134	103.6	85.0	194	150.0	123.1	254	196.3	161.1
15	11.6	09.5	75	58.0	47.6	135	104.4	85.6	195	150.7	123.7	255	197.1	161.8
16	12.4	10.1	76	58.7	48.2	136	105.1	86.3	196	151.5	124.3	256	197.9	162.4
17	13.1	10.8	77	59.5	48.8	137	105.9	86.9	197	152.3	125.0	257	198.7	163.0
18	13.9	11.4	78	60.3	49.5	138	106.7	87.5	198	153.1	125.6	258	199.4	163.7
19	14.7	12.0	79	61.1	50.1	139	107.4	88.2	199	153.8	126.2	259	200.2	164.3
20	15.5	12.7	80	61.8	50.7	140	108.2	88.8	200	154.6	126.9	260	201.0	164.
21	16.2	13.3	81	62.6	51.4	141	109.0	89.4	201	155.4	127.5	261	201.8	165
22	17.0	14.0	82	63.4	52.0	142	109.8	90.1	202	156.1	128.1	262	202.5	166.2
23	17.8	14.6	83	64.2	52.7	143	110.5	90.7	203	156.9	128.8	263	203.3	166.8
24	18.6	15.2	84	64.9	53.3	144	111.3	91.3	204	157.7	129.4	264	204.1	167.5
25	19.3	15.9	85	65.7	53.9	145	112.1	92.0	205	158.5	130.0	265	204.8	168.1
26	20.1	16.5	86	66.5	54.6	146	112.9	92.6	206	159.2	130.7	266	205.6	168.7
27	20.9	17.1	87	67.2	55.2	147	113.6	93.3	207	160.0	131.3	267	206.4	169.4
28	21.6	17.8	88	68.0	55.8	148	114.4	93.9	208	160.8	132.0	268	207.2	170.0
29	22.4	18.4	89	68.8	56.5	149	115.2	94.5	209	161.6	132.6	269	207.9	170.6
30	23.2	19.0	90	69.6	57.1	150	115.9	95.2	210	162.3	133.2	270	208.7	171.3
31	24.0	19.7	91	70.3	57.7	151	116.7	95.8	211	163.1	133.9	271	209.5	171.9
32	24.7	20.3	92	71.1	58.4	152	117.5	96.4	212	163.9	134.5	272	210.3	172.6
33	25.5	20.9	93	71.9	59.0	153	118.3	97.1	213	164.6	135.1	273	211.0	173.2
34	26.3	21.6	94	72.7	59.6	154	119.0	97.7	214	165.4	135.8	274	211.8	173.8
35	27.1	22.2	95	73.4	60.3	155	119.8	98.3	215	166.2	136.4	275	212.6	174.5
36	27.8	22.8	96	74.2	60.9	156	120.6	99.0	216	167.0	137.0	276	213.3	175.1
37	28.6	23.5	97	75.0	61.5	157	121.4	99.6	217	167.7	137.7	277	214.1	175.7
38	29.4	24.1	98	75.7	62.2	158	122.1	100.2	218	168.5	138.3	278	214.9	176.4
39	30.1	24.7	99	76.5	62.8	159	122.9	100.9	219	169.3	138.9	279	215.7	177.0
40	30.9	25.4	100	77.3	63.4	160	123.7	101.5	220	170.1	139.6	280	216.4	177.6
41	31.7	26.0	101	78.1	64.1	161	124.4	102.1	221	170.8	140.2	281	217.2	178.3
42	32.5	26.6	102	78.8	64.7	162	125.2	102.8	222	171.6	140.8	282	218.0	178.9
43	33.2	27.3	103	79.6	65.3	163	126.0	103.4	223	172.4	141.5	283	218.8	179.5
44	34.0	27.9	104	80.4	66.0	164	126.8	104.0	224	173.1	142.1	284	219.5	180.2
45	34.8	28.5	105	81.2	66.6	165	127.5	104.7	225	173.9	142.7	285	220.3	180.8
46	35.6	29.2	106	81.9	67.2	166	128.3	105.3	226	174.7	143.4	286	221.1	181.4
47	36.3	29.8	107	82.7	67.9	167	129.1	105.9	227	175.5	144.0	287	221.8	182.1
48	37.1	30.4	108	83.5	68.5	168	129.9	106.6	228	176.2	144.6	288	222.6	182.7
49	37.9	31.1	109	84.3	69.1	169	130.6	107.2	229	177.0	145.3	289	223.4	183.3
50	38.6	31.7	110	85.0	69.8	170	131.4	107.8	230	177.8	145.9	290	224.2	184.0
51	39.4	32.3	111	85.8	70.4	171	132.2	108.5	231	178.6	146.5	291	224.9	184.6
52	40.2	33.0	112	86.6	71.0	172	133.0	109.1	232	179.3	147.2	292	225.7	185.2
53	41.0	33.6	113	87.3	71.7	173	133.7	109.7	233	180.1	147.8	293	226.5	185.9
54	41.7	34.3	114	88.1	72.3	174	134.5	110.4	234	180.9	148.4	294	227.3	186.5
55	42.5	34.9	115	88.9	73.0	175	135.3	111.0	235	181.7	149.1	295	228.0	187.1
56	43.3	35.5	116	89.7	73.6	176	136.0	111.6	236	182.4	149.7	296	228.8	187.8
57	44.1	36.2	117	90.4	74.2	177	136.8	112.3	237	183.2	150.3	297	229.6	188.4
58	44.8	36.8	118	91.2	74.9	178	137.6	112.9	238	184.0	151.0	298	230.4	189.0
59	45.6	37.4	119	92.0	75.5	179	138.4	113.6	239	184.7	151.6	299	231.1	189.7
60	46.4	38.1	120	92.8	76.1	180	139.1	114.2	240	185.5	152.3	300	231.9	190.3
Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.

For 4½ Points.

TABLE I.

Difference of Latitude and Departure for 3¾ Points.

Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.
1	00.7	00.7	61	45.2	41.0	121	89.6	81.3	181	134.1	121.5	241	178.6	161.8
2	01.5	01.3	62	45.9	41.6	122	90.4	81.9	182	134.8	122.2	242	179.3	162.5
3	02.2	02.0	63	46.7	42.3	123	91.1	82.6	183	135.6	122.9	243	180.0	163.2
4	03.0	02.7	64	47.4	43.0	124	91.9	83.3	184	136.3	123.6	244	180.8	163.8
5	03.7	03.4	65	48.2	43.6	125	92.6	83.9	185	137.1	124.2	245	181.5	164.5
6	04.4	04.0	66	48.9	44.3	126	93.4	84.6	186	137.8	124.9	246	182.3	165.2
7	05.2	04.7	67	49.6	45.0	127	94.1	85.3	187	138.6	125.6	247	183.0	165.9
8	05.9	05.4	68	50.4	45.7	128	94.8	86.0	188	139.3	126.2	248	183.8	166.5
9	06.7	06.0	69	51.1	46.3	129	95.6	86.6	189	140.0	126.9	249	184.5	167.2
10	07.4	06.7	70	51.9	47.0	130	96.3	87.3	190	140.8	127.6	250	185.2	167.9
11	08.2	07.4	71	52.6	47.7	131	97.1	88.0	191	141.5	128.3	251	186.0	168.5
12	08.9	08.1	72	53.3	48.3	132	97.8	88.6	192	142.3	128.9	252	186.7	169.2
13	09.6	08.7	73	54.1	49.0	133	98.5	89.3	193	143.0	129.6	253	187.5	169.9
14	10.4	09.4	74	54.8	49.7	134	99.3	90.0	194	143.7	130.3	254	188.2	170.6
15	11.1	10.1	75	55.6	50.4	135	100.0	90.7	195	144.5	130.9	255	188.9	171.2
16	11.9	10.7	76	56.3	51.0	136	100.8	91.3	196	145.2	131.6	256	189.7	171.9
17	12.6	11.4	77	57.0	51.7	137	101.5	92.0	197	146.0	132.3	257	190.4	172.6
18	13.3	12.1	78	57.8	52.4	138	102.2	92.7	198	146.7	133.0	258	191.2	173.2
19	14.1	12.8	79	58.5	53.0	139	103.0	93.3	199	147.4	133.6	259	191.9	173.9
20	14.8	13.4	80	59.3	53.7	140	103.7	94.0	200	148.2	134.3	260	192.6	174.6
21	15.6	14.1	81	60.0	54.4	141	104.5	94.7	201	148.9	135.0	261	193.4	175.3
22	16.3	14.8	82	60.8	55.1	142	105.2	95.4	202	149.7	135.6	262	194.1	175.9
23	17.0	15.4	83	61.5	55.7	143	106.0	96.0	203	150.4	136.3	263	194.9	176.6
24	17.8	16.1	84	62.2	56.4	144	106.7	96.7	204	151.1	137.0	264	195.6	177.3
25	18.5	16.8	85	63.0	57.1	145	107.4	97.4	205	151.9	137.7	265	196.3	178.0
26	19.3	17.5	86	63.7	57.7	146	108.2	98.0	206	152.6	138.3	266	197.1	178.6
27	20.0	18.1	87	64.5	58.4	147	108.9	98.7	207	153.4	139.0	267	197.8	179.3
28	20.7	18.8	88	65.2	59.1	148	109.7	99.4	208	154.1	139.7	268	198.6	180.0
29	21.5	19.5	89	65.9	59.8	149	110.4	100.1	209	154.9	140.3	269	199.3	180.6
30	22.2	20.1	90	66.7	60.4	150	111.1	100.7	210	155.6	141.0	270	200.1	181.3
31	23.0	20.8	91	67.4	61.1	151	111.9	101.4	211	156.3	141.7	271	200.8	182.0
32	23.7	21.5	92	68.2	61.8	152	112.6	102.1	212	157.1	142.4	272	201.5	182.7
33	24.4	22.2	93	68.9	62.4	153	113.4	102.7	213	157.8	143.0	273	202.3	183.3
34	25.2	22.8	94	69.6	63.1	154	114.1	103.4	214	158.6	143.7	274	203.0	184.0
35	25.9	23.5	95	70.4	63.8	155	114.8	104.1	215	159.3	144.4	275	203.8	184.7
36	26.7	24.2	96	71.1	64.5	156	115.6	104.8	216	160.0	145.0	276	204.5	185.3
37	27.4	24.8	97	71.9	65.1	157	116.3	105.4	217	160.8	145.7	277	205.2	186.0
38	28.2	25.5	98	72.6	65.8	158	117.1	106.1	218	161.5	146.4	278	206.0	186.7
39	28.9	26.2	99	73.3	66.5	159	117.8	106.8	219	162.3	147.1	279	206.7	187.4
40	29.6	26.9	100	74.1	67.2	160	118.5	107.4	220	163.0	147.7	280	207.5	188.0
41	30.4	27.5	101	74.8	67.8	161	119.3	108.1	221	163.7	148.4	281	208.2	188.7
42	31.1	28.2	102	75.6	68.5	162	120.0	108.8	222	164.5	149.1	282	208.9	189.4
43	31.9	28.9	103	76.3	69.2	163	120.8	109.5	223	165.2	149.7	283	209.7	190.0
44	32.6	29.5	104	77.1	69.8	164	121.5	110.1	224	166.0	150.4	284	210.4	190.7
45	33.3	30.2	105	77.8	70.5	165	122.3	110.8	225	166.7	151.1	285	211.2	191.4
46	34.1	30.9	106	78.5	71.2	166	123.0	111.5	226	167.4	151.8	286	211.9	192.1
47	34.8	31.6	107	79.3	71.8	167	123.7	112.1	227	168.2	152.4	287	212.6	192.7
48	35.6	32.2	108	80.0	72.5	168	124.5	112.8	228	168.9	153.1	288	213.4	193.4
49	36.3	32.9	109	80.8	73.2	169	125.2	113.5	229	169.7	153.8	289	214.1	194.1
50	37.0	33.6	110	81.5	73.9	170	126.0	114.2	230	170.4	154.5	290	214.9	194.7
51	37.8	34.2	111	82.2	74.5	171	126.7	114.8	231	171.2	155.1	291	215.6	195.4
52	38.5	34.9	112	83.0	75.2	172	127.4	115.5	232	171.9	155.8	292	216.4	196.1
53	39.3	35.6	113	83.7	75.9	173	128.2	116.2	233	172.6	156.5	293	217.1	196.8
54	40.0	36.3	114	84.5	76.5	174	128.9	116.8	234	173.4	157.1	294	217.8	197.4
55	40.7	36.9	115	85.2	77.2	175	129.7	117.5	235	174.1	157.8	295	218.6	198.1
56	41.5	37.6	116	85.9	77.9	176	130.4	118.2	236	174.9	158.5	296	219.3	198.8
57	42.2	38.3	117	86.7	78.6	177	131.1	118.9	237	175.6	159.1	297	220.1	199.4
58	43.0	38.9	118	87.4	79.2	178	131.9	119.5	238	176.3	159.8	298	220.8	200.1
59	43.7	39.6	119	88.2	79.9	179	132.6	120.2	239	177.1	160.5	299	221.5	200.8
60	44.5	40.3	120	88.9	80.6	180	133.4	120.9	240	177.8	161.2	300	222.3	201.5
Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.

For 4¼ Points.

TABLE I.

Difference of Latitude and Departure for 2 Points.

Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.
1	00.9	00.4	61	56.4	23.3	121	111.8	46.3	181	167.2	69.3	241	222.7	92.2
2	01.9	00.8	62	57.3	23.7	122	112.7	46.7	182	168.2	69.7	242	223.6	92.6
3	02.8	01.2	63	58.2	24.1	123	113.6	47.1	183	169.1	70.0	243	224.5	93.0
4	03.7	01.5	64	59.1	24.5	124	114.6	47.5	184	170.0	70.4	244	225.4	93.4
5	04.6	01.9	65	60.1	24.9	125	115.5	47.8	185	170.9	70.8	245	226.4	93.8
6	05.5	02.3	66	61.0	25.3	126	116.4	48.2	186	171.8	71.2	246	227.3	94.1
7	06.5	02.7	67	61.9	25.6	127	117.3	48.6	187	172.8	71.6	247	228.2	94.5
8	07.4	03.1	68	62.8	26.0	128	118.3	49.0	188	173.7	71.9	248	229.1	94.9
9	08.3	03.4	69	63.8	26.4	129	119.2	49.4	189	174.6	72.3	249	230.1	95.3
10	09.2	03.8	70	64.7	26.8	130	120.1	49.8	190	175.5	72.7	250	231.0	95.6
11	10.2	04.2	71	65.6	27.2	131	121.0	50.1	191	176.5	73.1	251	231.9	96.1
12	11.1	04.6	72	66.5	27.6	132	122.0	50.5	192	177.4	73.5	252	232.8	96.4
13	12.0	05.0	73	67.4	27.9	133	122.9	50.9	193	178.3	73.9	253	233.7	96.8
14	12.9	05.4	74	68.4	28.3	134	123.8	51.3	194	179.2	74.2	254	234.7	97.2
15	13.9	05.7	75	69.3	28.7	135	124.7	51.7	195	180.2	74.6	255	235.6	97.6
16	14.8	06.1	76	70.2	29.1	136	125.7	52.0	196	181.1	75.0	256	236.5	98.0
17	15.7	06.5	77	71.1	29.5	137	126.6	52.4	197	182.0	75.4	257	237.4	98.4
18	16.6	06.9	78	72.1	29.9	138	127.5	52.8	198	182.9	75.8	258	238.4	98.7
19	17.6	07.3	79	73.0	30.2	139	128.4	53.2	199	183.9	76.2	259	239.3	99.1
20	18.5	07.7	80	73.9	30.6	140	129.3	53.6	200	184.8	76.5	260	240.2	99.5
21	19.4	08.0	81	74.8	31.0	141	130.3	54.0	201	185.7	76.9	261	241.1	99.9
22	20.3	08.4	82	75.8	31.4	142	131.2	54.3	202	186.6	77.3	262	242.1	100.3
23	21.3	08.8	83	76.7	31.8	143	132.1	54.7	203	187.6	77.7	263	243.0	100.6
24	22.2	09.2	84	77.6	32.2	144	133.0	55.1	202	188.5	78.1	264	243.9	101.0
25	23.1	09.6	85	78.5	32.5	145	134.0	55.5	205	189.4	78.5	265	244.8	101.4
26	24.0	10.0	86	79.5	32.9	146	134.9	55.9	206	190.3	78.8	266	245.8	101.8
27	24.9	10.3	87	80.4	33.3	147	135.8	56.3	207	191.2	79.2	267	246.7	102.2
28	25.9	10.7	88	81.3	33.7	148	136.7	56.6	208	192.2	79.6	268	247.6	102.6
29	26.8	11.1	89	82.2	34.1	149	137.7	57.0	209	193.1	80.0	269	248.5	102.9
30	27.7	11.5	90	83.2	34.4	150	138.6	57.4	210	194.0	80.4	270	249.5	103.3
31	28.6	11.9	91	84.1	34.8	151	139.5	57.8	211	194.9	80.8	271	250.4	103.7
32	29.6	12.3	92	85.0	35.2	152	140.4	58.2	212	195.9	81.1	272	251.3	104.1
33	30.5	12.6	93	85.9	35.6	153	141.4	58.6	213	196.8	81.5	273	252.2	104.5
34	31.4	13.0	94	86.9	36.0	154	142.3	58.9	214	197.7	81.9	274	253.1	104.9
35	32.3	13.4	95	87.8	36.4	155	143.2	59.3	215	198.6	82.3	275	254.1	105.2
36	33.3	13.8	96	88.7	36.7	156	144.1	59.7	216	199.6	82.7	276	255.0	105.6
37	34.2	14.2	97	89.6	37.1	157	145.1	60.1	217	200.5	83.0	277	255.9	106.0
38	35.1	14.5	98	90.5	37.5	158	146.0	60.5	218	201.4	83.4	278	256.8	106.4
39	36.0	14.9	99	91.5	37.9	159	146.9	60.9	219	202.3	83.8	279	257.8	106.8
40	37.0	15.3	100	92.4	38.3	160	147.8	61.2	220	203.3	84.2	280	258.7	107.2
41	37.9	15.7	101	93.3	38.7	161	148.7	61.6	221	204.2	84.6	281	259.6	107.5
42	38.8	16.1	102	94.2	39.0	162	149.7	62.0	222	205.1	85.0	282	260.5	107.9
43	39.7	16.5	103	95.2	39.4	163	150.6	62.4	223	206.0	85.3	283	261.5	108.3
44	40.6	16.8	104	96.1	39.8	164	151.5	62.8	224	207.0	85.7	284	262.4	108.7
45	41.6	17.2	105	97.0	40.2	165	152.4	63.1	225	207.9	86.1	285	263.3	109.1
46	42.5	17.6	106	97.9	40.6	166	153.4	63.5	226	208.8	86.5	286	264.2	109.5
47	43.4	18.0	107	98.8	41.0	167	154.3	63.9	227	209.7	86.9	287	265.2	109.8
48	44.4	18.4	108	99.8	41.3	168	155.2	64.3	228	210.6	87.3	288	266.1	110.2
49	45.3	18.8	109	100.7	41.7	169	156.1	64.7	229	211.6	87.6	289	267.0	110.6
50	46.2	19.1	110	101.6	42.1	170	157.1	65.1	230	212.5	88.0	290	267.9	111.0
51	47.1	19.5	111	102.6	42.5	171	158.0	65.4	231	213.4	88.4	291	268.9	111.4
52	48.0	19.9	112	103.5	42.9	172	158.9	65.8	232	214.3	88.8	292	269.8	111.7
53	49.0	20.3	113	104.4	43.2	173	159.8	66.2	233	215.3	89.2	293	270.7	112.1
54	49.9	20.7	114	105.3	43.6	174	160.8	66.6	234	216.2	89.6	294	271.6	112.5
55	50.8	21.1	115	106.3	41.0	175	161.7	67.0	235	217.1	89.9	295	272.5	112.9
56	51.7	21.4	116	107.2	44.4	176	162.6	67.4	236	218.0	90.3	296	273.5	113.3
57	52.7	21.8	117	108.1	44.8	177	163.5	67.7	237	219.0	90.7	297	274.4	113.7
58	53.6	22.2	118	109.0	45.2	178	164.5	68.1	238	219.9	91.1	298	275.3	114.0
59	54.5	22.6	119	109.9	45.5	179	165.4	68.5	239	220.8	91.5	299	276.2	114.4
60	55.4	23.0	120	110.9	45.9	180	166.3	68.9	240	221.7	91.8	300	277.2	114.8
Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.

For 6 Points.

TABLE I.

Difference of Latitude and Departure for 2¼ Points.

Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.
1	00.9	00.4	61	55.1	26.1	121	109.4	51.7	181	163.6	77.4	241	217.9	103.0
2	01.8	00.9	62	56.0	26.5	122	110.3	52.2	182	164.5	77.8	242	218.8	103.5
3	02.7	01.3	63	57.0	26.9	123	111.2	52.6	183	165.4	78.3	243	219.7	103.9
4	03.6	01.7	64	57.9	27.4	124	112.1	53.0	184	166.3	78.7	244	220.6	104.3
5	04.5	02.1	65	58.8	27.8	125	113.0	53.5	185	167.2	79.1	245	221.5	104.8
6	05.4	02.6	66	59.7	28.2	126	113.9	53.9	186	168.1	79.5	246	222.4	105.2
7	06.3	03.0	67	60.6	28.7	127	114.8	54.3	187	169.0	80.0	247	223.3	105.6
8	07.2	03.4	68	61.5	29.1	128	115.7	54.7	188	169.9	80.4	248	224.2	106.1
9	08.1	03.8	69	62.4	29.5	129	116.6	55.2	189	170.9	80.8	249	225.1	106.5
10	09.0	04.3	70	63.3	29.9	130	117.5	55.6	190	171.8	81.3	250	226.0	106.9
11	09.9	04.7	71	64.2	30.4	131	118.4	56.0	191	172.7	81.7	251	226.9	107.3
12	10.8	05.1	72	65.1	30.8	132	119.3	56.5	192	173.6	82.1	252	227.8	107.8
13	11.8	05.6	73	66.0	31.2	133	120.2	56.9	193	174.5	82.5	253	228.7	108.2
14	12.7	06.0	74	66.9	31.6	134	121.1	57.3	194	175.4	83.0	254	229.6	108.6
15	13.6	06.4	75	67.8	32.1	135	122.0	57.7	195	176.3	83.4	255	230.5	109.0
16	14.5	06.8	76	68.7	32.5	136	122.9	58.2	196	177.2	83.8	256	231.4	109.5
17	15.4	07.3	77	69.6	32.9	137	123.8	58.6	167	178.1	84.2	257	232.3	109.9
18	16.3	07.7	78	70.5	33.4	138	124.7	59.0	198	179.0	84.7	258	233.2	110.3
19	17.2	08.1	79	71.4	33.8	139	125.7	59.4	199	179.9	85.1	259	234.1	110.8
20	18.1	08.6	80	72.3	34.2	140	126.6	59.9	200	180.8	85.5	260	235.0	111.2
21	19.0	09.0	81	73.2	34.6	141	127.5	60.3	201	181.7	85.9	261	235.9	111.6
22	19.9	09.4	82	74.1	35.1	142	128.4	60.7	202	182.6	86.4	262	236.8	112.0
23	20.8	09.8	83	75.0	35.5	143	129.3	61.2	203	183.5	86.8	263	237.7	112.5
24	21.7	10.3	84	75.9	35.9	144	130.2	61.6	204	184.4	87.2	264	238.7	112.9
25	22.6	10.7	85	76.8	36.3	145	131.1	62.0	205	185.3	87.7	265	239.6	113.3
26	23.5	11.1	86	77.7	36.8	146	132.0	62.4	206	186.2	88.1	266	240.5	113.7
27	24.4	11.5	87	78.7	37.2	147	132.9	62.9	207	187.1	88.5	267	241.4	114.2
28	25.3	12.0	88	79.6	37.6	148	133.8	63.3	208	188.0	88.9	268	242.3	114.6
29	26.2	12.4	89	80.5	38.1	149	134.7	63.7	209	188.9	89.4	269	243.2	115.0
30	27.1	12.8	90	81.4	38.5	150	135.6	64.1	210	189.8	89.8	270	244.1	115.5
31	28.0	13.3	91	82.3	38.9	151	136.5	64.6	211	190.7	90.2	271	245.0	115.9
32	28.9	13.7	92	83.2	39.3	152	137.4	65.0	212	191.6	90.7	272	245.9	116.3
33	29.8	14.1	93	84.1	39.8	153	138.3	65.4	213	192.6	91.1	273	246.8	116.7
34	30.7	14.5	94	85.0	40.2	154	139.2	65.9	214	193.5	91.5	274	247.7	117.2
35	31.6	15.0	95	85.9	40.6	155	140.1	66.3	215	994.4	91.9	275	248.6	117.6
36	32.5	15.4	96	86.8	41.1	156	141.0	66.7	216	195.3	92.4	276	249.5	118.0
37	33.4	15.8	97	87.7	41.5	157	141.9	67.1	217	196.2	92.8	277	250.4	118.5
38	34.4	16.3	98	88.6	41.9	158	142.8	67.6	218	197.1	93.2	278	251.3	118.9
39	35.3	16.7	99	89.5	42.3	159	143.7	68.0	219	198.0	93.7	279	252.2	119.3
40	36.2	17.1	100	90.4	42.8	160	144.6	68.4	220	198.9	94.1	280	253.1	119.7
41	37.1	17.5	101	91.3	43.2	161	145.5	68.8	221	199.8	94.5	281	254.0	120.2
42	38.0	18.0	102	92.2	43.6	162	146.4	69.3	222	200.7	94.9	282	254.9	120.6
43	38.9	18.4	103	93.1	44.1	163	147.3	69.7	223	201.6	95.4	283	255.8	121.0
44	39.8	18.8	104	94.0	44.5	164	148.3	70.1	224	202.5	95.8	284	256.7	121.5
45	40.7	19.2	105	94.9	44.9	165	149.2	70.6	225	203.4	96.2	285	257.6	121.9
46	41.6	19.7	106	95.8	45.3	166	150.1	71.0	226	204.3	96.6	286	258.5	122.3
47	42.5	20.1	107	96.7	45.8	167	151.0	71.4	227	205.2	97.1	287	259.4	122.7
48	43.4	20.5	108	97.6	46.2	168	151.9	71.8	228	206.1	97.5	288	260.3	123.2
49	44.3	21.0	109	98.5	46.6	169	152.8	72.3	229	207.0	97.9	289	261.3	123.6
50	45.2	21.4	110	99.4	47.0	170	153.7	72.7	230	207.9	98.4	290	262.2	124.0
51	46.1	21.8	111	100.3	47.5	171	154.6	73.1	231	208.8	98.8	291	263.1	124.4
52	47.0	22.2	112	101.2	47.9	172	155.5	73.6	232	209.7	99.2	292	264.0	124.9
53	47.9	22.7	113	102.2	48.3	173	156.4	74.0	233	210.6	99.6	293	264.9	125.3
54	48.8	23.1	114	103.1	48.7	174	157.3	74.4	234	211.5	100.1	294	265.8	125.7
55	49.7	23.5	115	104.0	49.2	175	158.2	74.8	235	212.4	100.5	295	266.7	126.2
56	50.6	23.9	116	104.9	49.6	176	159.1	75.3	236	213.3	100.9	296	267.6	126.6
57	51.5	24.4	117	105.8	50.0	177	160.0	75.7	237	214.2	101.4	297	268.5	127.0
58	52.4	24.8	118	106.7	50.5	178	160.9	76.1	238	215.1	101.8	298	269.4	127.4
59	53.3	25.2	119	107.6	50.9	179	161.8	76.5	239	216.1	102.2	299	270.3	127.9
60	54.2	25.7	120	108.5	51.3	180	162.7	77.0	240	217.0	102.6	300	271.2	128.3
Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.

For 5¾ Points.

TABLE I.

Difference of Latitude and Departure for 2½ Points.

Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.
1	00.9	00.5	61	53.8	28.8	121	106.7	57.0	181	159.6	85.3	241	212.5	113.6
2	01.8	00.9	62	54.7	29.2	122	107.6	57.5	182	160.5	85.8	242	213.4	114.1
3	02.6	01.4	63	55.6	29.7	123	108.5	58.0	183	161.4	86.3	243	214.3	114.6
4	03.5	01.9	64	56.4	30.2	124	109.4	58.4	184	162.3	86.7	244	215.2	115.0
5	04.4	02.4	65	57.3	30.6	125	110.2	58.9	185	163.2	87.2	245	216.1	115.5
6	05.3	02.8	66	58.2	31.1	126	111.1	59.4	186	164.0	87.7	246	217.0	116.0
7	06.2	03.3	67	59.1	31.6	127	112.0	59.9	187	164.9	88.1	247	217.8	116.4
8	07.1	03.8	68	60.0	32.1	128	112.9	60.3	188	165.8	88.6	248	218.7	116.9
9	07.9	04.2	69	60.9	32.5	129	113.8	60.8	189	166.7	89.1	249	219.6	117.4
10	08.8	04.7	70	61.7	33.0	130	114.7	61.3	190	167.6	89.6	250	220.5	117.8
11	09.7	05.2	71	62.6	33.5	131	115.5	61.7	191	168.5	90.0	251	221.4	118.3
12	10.6	05.7	72	63.5	33.9	132	116.4	62.2	192	169.3	90.5	252	222.2	118.8
13	11.5	06.1	73	64.4	34.4	133	117.3	62.7	193	170.2	91.0	253	223.1	119.3
14	12.3	06.6	74	65.3	34.9	134	118.2	63.2	194	171.1	91.4	254	224.0	119.7
15	13.2	07.1	75	66.1	35.4	135	119.1	63.6	195	172.0	91.9	255	224.9	120.2
16	14.1	07.5	76	67.0	35.8	136	119.9	64.1	196	172.9	92.4	256	225.8	120.7
17	15.0	08.0	77	67.9	36.3	137	120.8	64.6	197	173.7	92.9	257	226.7	121.1
18	15.9	08.5	78	68.8	36.8	138	121.7	65.0	198	174.6	93.3	258	227.5	121.6
19	16.8	09.0	79	69.7	37.2	139	122.6	65.5	199	175.5	93.8	259	228.4	122.1
20	17.6	09.4	80	70.6	37.7	140	123.5	66.0	200	176.4	94.3	260	229.3	122.6
21	18.5	09.9	81	71.4	38.2	141	124.4	66.5	201	177.3	94.7	261	230.2	123.0
22	19.4	10.4	82	72.3	38.6	142	125.2	66.9	202	178.2	95.2	262	231.1	123.5
23	20.3	10.8	83	73.2	39.1	143	126.1	67.4	203	179.0	95.7	263	231.9	124.0
24	21.2	11.3	84	74.1	39.6	144	127.0	67.9	204	179.9	96.2	264	232.8	124.4
25	22.1	11.8	85	75.0	40.1	145	127.9	68.3	205	180.8	96.6	265	233.7	124.9
26	22.9	12.3	86	75.9	40.5	146	128.8	68.8	206	181.7	97.1	266	234.6	125.4
27	23.8	12.7	87	76.7	41.0	147	129.6	69.3	207	182.6	97.6	267	235.5	125.9
28	24.7	13.2	88	77.6	41.5	148	130.5	69.8	208	183.4	98.0	268	236.4	126.3
29	25.6	13.7	89	78.5	41.9	149	131.4	70.2	209	184.3	98.5	269	237.2	126.8
30	26.5	14.1	90	79.4	42.4	150	132.3	70.7	210	185.2	99.0	270	238.1	127.3
31	27.3	14.6	91	80.3	42.9	151	133.2	71.2	211	186.1	99.5	271	239.0	127.7
32	28.2	15.1	92	81.1	43.4	152	134.1	71.6	212	187.0	99.9	272	239.9	128.2
33	29.1	15.6	93	82.0	43.8	153	134.9	72.1	213	187.8	100.4	273	240.8	128.7
34	30.0	16.0	94	82.9	44.3	154	135.8	72.6	214	188.7	100.9	274	241.7	129.2
35	30.9	16.5	95	83.8	44.8	155	136.7	73.1	215	189.6	101.3	275	242.5	129.6
36	31.8	17.0	96	84.7	45.2	156	137.6	73.5	216	190.5	101.8	276	243.4	130.1
37	32.6	17.4	97	85.6	45.7	157	138.5	74.0	217	191.4	102.3	277	244.3	130.6
38	33.5	17.9	98	86.4	46.2	158	139.3	74.5	218	192.3	102.8	278	245.2	131.0
39	34.4	18.4	99	87.3	46.7	159	140.2	74.9	219	193.1	103.2	279	246.1	131.5
40	35.3	18.9	100	88.2	47.1	169	141.1	75.4	220	194.0	103.7	280	246.9	132.0
41	36.2	19.3	101	89.1	47.6	161	142.0	75.9	221	194.9	104.2	281	247.8	132.5
42	37.0	19.8	102	90.0	48.1	162	142.9	76.4	222	195.8	104.6	282	248.7	132.9
43	37.9	20.3	103	90.8	48.5	163	143.8	76.8	223	196.7	105.1	283	249.6	133.4
44	38.8	20.7	104	91.7	49.0	164	144.6	77.3	224	197.6	105.6	284	250.5	133.9
45	39.7	21.2	105	92.6	49.5	165	145.5	77.8	225	198.4	106.1	285	251.4	134.3
46	40.6	21.7	106	93.5	50.0	166	146.4	78.2	226	199.3	106.5	286	252.2	134.8
47	41.5	22.2	107	94.4	50.4	167	147.3	78.7	227	200.2	107.0	287	253.1	135.3
48	42.3	22.6	108	95.3	50.9	168	148.2	79.2	228	201.1	107.5	288	254.0	135.8
49	43.2	23.1	109	96.1	51.4	169	149.0	79.7	229	202.0	107.9	289	254.9	136.2
50	44.1	23.6	110	97.0	51.8	170	149.9	80.1	230	202.8	108.4	290	255.8	136.7
51	45.0	24.0	111	97.9	52.3	171	150.8	80.6	231	203.7	108.9	291	256.6	137.2
52	45.9	24.5	112	98.8	52.8	172	151.7	81.1	232	204.6	109.4	292	257.5	137.6
53	46.7	25.0	113	99.7	53.3	173	152.6	81.5	233	205.5	109.8	293	258.4	138.1
54	47.6	25.5	114	100.5	53.7	174	153.5	82.0	234	206.4	110.3	294	259.3	138.6
55	48.5	25.9	115	101.4	54.2	175	154.3	82.5	235	207.3	110.8	295	260.2	139.1
56	49.4	26.4	116	102.3	54.7	176	155.2	83.0	236	208.1	111.2	296	261.1	139.5
57	50.3	26.9	117	103.2	55.1	177	156.1	83.4	237	209.0	111.7	297	261.9	140.0
58	51.2	27.3	118	104.1	55.6	178	157.0	83.9	238	209.9	112.2	298	262.8	140.5
59	52.0	27.8	119	105.0	56.1	179	157.9	84.4	239	210.8	112.7	299	263.7	140.9
60	52.9	28.3	120	105.8	56.6	180	158.8	84.8	240	211.7	113.1	300	264.6	141.4
Dist	Dep.	Lat.	Dist	Dep.	Lat	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.

For 5½ Points.

TABLE I.

Difference of Latitude and Departure for 2¾ Points.

Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.
1	00.9	00.5	61	52.3	31.4	121	103.8	62.2	181	155.3	93.0	241	206.7	123.9
2	01.7	01.0	62	53.2	31.9	122	104.6	62.7	182	156.1	93.6	242	207.6	124.4
3	02.6	01.5	63	54.0	32.4	123	105.5	63.2	183	157.0	94.1	243	208.4	124.9
4	03.4	02.1	64	54.9	32.9	124	106.4	63.7	184	157.8	94.6	244	209.3	125.4
5	04.3	02.6	65	55.8	33.4	125	107.2	64.3	185	158.7	95.1	245	210.1	125.9
6	05.1	03.1	66	56.6	33.9	126	108.1	64.8	186	159.5	95.6	246	211.0	126.5
7	06.0	03.6	67	57.5	34.4	127	108.9	65.3	187	160.4	96.1	247	211.9	127.0
8	06.9	04.1	68	58.3	35.0	128	109.8	65.8	188	161.2	96.6	248	212.7	127.5
9	07.7	04.6	69	59.2	35.5	129	110.6	66.3	189	162.1	97.2	249	213.6	128.0
10	08.6	05.1	70	60.0	36.0	130	111.5	66.8	190	163.0	97.7	250	214.4	128.5
11	09.4	05.7	71	60.9	36.5	131	112.4	67.3	191	163.8	98.2	251	215.3	129.0
12	10.3	06.2	72	61.8	37.0	132	113.2	67.9	192	164.7	98.7	252	216.1	129.5
13	11.2	06.7	73	62.6	37.5	133	114.1	68.4	193	165.5	99.2	253	217.0	130.1
14	12.0	07.2	74	63.5	38.0	134	114.9	68.9	194	166.4	99.7	254	217.9	130.6
15	12.9	07.7	75	64.3	38.6	135	115.8	69.4	195	167.3	100.2	255	218.7	131.1
16	13.7	08.2	76	65.2	39.1	136	116.6	69.9	196	168.1	100.8	256	219.6	131.6
17	14.6	08.7	77	66.0	39.6	137	117.5	70.4	197	169.0	101.3	257	220.4	132.1
18	15.4	09.3	78	66.9	40.1	138	118.4	70.9	198	169.8	101.8	258	221.3	132.6
19	16.3	09.8	79	67.8	40.6	139	119.2	71.5	199	170.7	102.3	259	222.2	133.1
20	17.2	10.3	80	68.6	41.1	140	120.1	72.0	200	171.5	102.8	260	223.0	133.7
21	18.0	10.8	81	69.5	41.6	141	120.9	72.5	201	172.4	103.3	261	223.9	134.2
22	18.9	11.3	82	70.3	42.1	142	121.8	73.0	202	173.3	103.8	262	224.7	134.7
23	19.7	11.8	83	71.2	42.7	143	122.7	73.5	203	174.1	104.4	263	225.6	135.2
24	20.6	12.3	84	72.0	43.2	144	123.5	74.0	204	175.0	104.9	264	226.4	135.7
25	21.4	12.9	85	72.9	43.7	145	124.4	74.5	205	175.8	105.4	265	227.3	136.2
26	22.3	13.4	86	73.8	44.2	146	125.2	75.1	206	176.7	105.9	266	228.2	136.7
27	23.2	13.9	87	74.6	44.7	147	126.1	75.6	207	177.5	106.4	267	229.0	137.3
28	24.0	14.4	88	75.5	45.2	148	126.9	76.1	208	178.4	106.9	268	229.9	137.8
29	24.9	14.9	89	76.3	45.7	149	127.8	76.6	209	179.3	107.4	269	230.7	138.3
30	25.7	15.4	90	77.2	46.3	150	128.7	77.1	210	180.1	108.0	270	231.6	138.8
31	26.6	15.9	91	78.1	46.8	151	129.5	77.6	211	181.0	108.5	271	232.4	139.3
32	27.4	16.5	92	78.9	47.3	152	130.4	78.1	212	181.8	109.0	272	233.3	139.8
33	28.3	17.0	93	79.8	47.8	153	131.2	78.7	213	182.7	109.5	273	234.2	140.3
34	29.2	17.5	94	80.6	48.3	154	132.1	79·2	214	183.5	110.0	274	235.0	140.9
35	30.0	18.0	95	81.5	48.8	155	132.9	79.7	215	184.4	110.5	275	235.9	141.4
36	30.9	18.5	96	82.3	49.3	156	133.8	80.2	216	185.3	111.0	276	236.7	141.9
37	31.7	19.0	97	83.2	49.9	157	134.7	80.7	217	186.1	111.6	277	237.6	142.4
38	32.6	19.5	98	84.1	50.4	158	135.5	81.2	218	187.0	112.1	278	238.4	142.9
39	33.5	20.1	99	84.9	50.9	159	136.4	81.7	219	187.8	112.6	279	239.3	143.4
40	34.3	20.6	100	85.8	51.4	160	137.2	82.3	220	188.7	113.1	280	240.2	143.9
41	35.2	21.1	101	86.6	51.9	161	138.1	82.8	221	189.6	113.6	281	241.0	144.5
42	36.0	21.6	102	87.5	52.4	162	138.9	83.3	222	190.4	114.1	282	241.9	145.0
43	36.9	22.1	103	88.3	52.9	163	139.8	83.8	223	191.3	114.6	283	242.7	145.5
44	37.7	22.6	104	89.2	53.5	164	140.7	84.3	224	192.1	115.2	284	243.6	146.0
45	38.6	23.1	105	90.1	54.0	165	141.5	84.8	225	193.0	115.7	285	244.4	146.5
46	39.5	23.6	106	90.9	54.5	166	142.4	85.3	226	193.8	116.2	286	245.3	147.0
47	40.3	24.2	107	91.8	55.0	167	143.2	85.8	227	194.7	116.7	287	246.2	147.5
48	41.2	24.7	108	92.6	55.5	168	144.1	86.4	228	195.6	117.2	288	247.0	148.1
49	42.0	25.2	109	93.5	56.0	169	145.0	86.9	229	196.4	117.7	289	247.9	148.6
50	42.9	25.7	110	94.3	56.5	170	145.8	87.4	230	197.3	118.2	290	248.7	149.1
51	43.7	26.2	111	95.2	57.1	171	146.7	87.9	231	198.1	118.8	291	249.6	149.6
52	44.6	26.7	112	96.1	57.6	172	147.5	88.4	232	199.0	119.3	292	250.5	150.1
53	45.5	27.2	113	96.9	58.1	173	148.4	88.9	233	199.8	119.8	293	251.3	150.6
54	46.3	27.8	114	97.8	58.6	174	149.2	89.4	234	200.7	120.3	294	252.2	151.1
55	47.2	28.3	115	98.6	59.1	175	150.1	90.0	235	201.6	120.8	295	253.0	151.7
56	48.0	28.8	116	99.5	59.6	176	151.0	90.5	236	202.4	121.3	296	253.9	152.2
57	48.9	29.3	117	100.4	60.1	177	151.8	91.0	237	203.3	121.8	297	254.7	152.7
58	49.7	29.8	118	101.2	60.7	178	152.7	91.5	238	204.1	122.4	298	255.6	153.2
59	50.6	30.3	119	102.1	61.2	179	153.5	92.0	239	205.0	122.9	299	256.5	153.7
60	51.5	30.8	120	102.9	61.7	180	154.4	92.5	240	205.9	123.4	300	257.3	154.2
Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.

For 5¼ Points.

TABLE I.

Difference of Latitude and Departure for 3 Points.

Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat	Dep.	Dist	Lat.	Dep.
1	00.8	00.6	61	50.7	33.9	121	100.6	67.2	181	150.5	100.6	241	200.4	133.9
2	01.7	01.1	62	51.5	34.4	122	101.4	67.8	182	151.3	101.1	242	201.2	134.4
3	02.5	01.7	63	52.4	35.0	123	102.3	68.3	183	152.2	101.7	243	202.0	135.0
4	03.3	02.2	64	53.2	35.6	124	103.1	68.9	184	153.0	102.2	244	202.9	135.6
5	04.2	02.8	65	54.0	36.1	125	103.9	69.4	185	153.8	102.8	245	203.7	136.1
6	05.0	03.3	66	54.9	36.7	126	104.8	70.0	186	154.6	103.3	246	204.5	136.7
7	05.8	03.9	67	55.7	37.2	127	105.6	70.6	187	155.5	103.9	247	205.4	137.2
8	06.7	04.4	68	56.5	37.8	128	106.4	71.1	188	156.3	104.4	248	206.2	137.8
9	07.5	05.0	69	57.4	38.3	129	107.3	71.7	189	157.1	105.0	249	207.0	138.3
10	08.3	05.6	70	58.2	38.9	130	108.1	72.2	190	158.0	105.6	250	207.9	138.9
11	09.1	06.1	71	59.0	39.4	131	108.9	72.8	191	158.8	106.1	251	208.7	139.4
12	10.0	06.7	72	59.9	40.0	132	109.7	73.3	192	159.6	106.7	252	209.5	140.0
13	10.8	07.2	73	60.7	40.6	133	110.6	73.9	193	160.5	107.2	253	210.4	140.6
14	11.6	07.8	74	61.5	41.1	134	111.4	74.4	194	161.3	107.8	254	211.2	141.1
15	12.5	08.3	75	62.4	41.7	135	112.2	75.0	195	162.1	108.3	255	212.0	141.7
16	13.3	08.9	76	63.2	42.2	136	113.1	75.6	196	163.0	108.9	256	212.9	142.2
17	14.1	09.4	77	64.0	42.8	137	113.9	76.1	197	163.8	109.4	257	213.7	142.8
18	15.0	10.0	78	64.8	43.3	138	114.7	76.7	198	164.6	110.0	258	214.5	143.3
19	15.8	10.6	79	65.7	43.9	139	115.6	77.2	199	165.5	110.6	259	215.3	143.9
20	16.6	11.1	80	66.5	44.4	140	116.4	77.8	200	166.3	111.1	260	216.2	144.4
21	17.5	11.7	81	67.3	45.0	141	117.2	78.3	201	167.1	111.7	261	217.0	145.0
22	18.3	12.2	82	68.2	45.6	142	118.1	78.9	202	168.0	112.2	262	217.8	145.6
23	19.1	12.8	83	69.0	46.1	143	118.9	79.4	203	168.8	112.8	263	218.7	146.1
24	20.0	13.3	84	69.8	46.7	144	119.7	80.0	204	169.6	113.3	264	219.5	146.7
25	20.8	13.9	85	70.7	47.2	145	120.6	80.6	205	170.4	113.9	265	220.3	147.2
26	21.6	14.4	86	71.5	47.8	146	121.4	81.1	206	171.3	114.4	266	221.2	147.8
27	22.4	15.0	87	72.3	48.3	147	122.2	81.7	207	172.1	115.0	267	222.0	148.3
28	23.3	15.6	88	73.2	48.9	148	123.1	82.2	208	172.9	115.6	268	222.8	148.9
29	24.1	16.1	89	74.0	49.4	149	123.9	82.8	209	173.8	116.1	269	223.7	149.4
30	24.9	16.7	90	74.8	50.0	150	124.7	83.3	210	174.6	116.7	270	224.5	150.0
31	25.8	17.2	91	75.7	50.6	151	125.5	83.9	211	175.4	117.2	271	225.3	150.6
32	26.6	17.8	92	76.5	51.1	152	126.4	84.4	212	176.3	117.8	272	226.2	151.1
33	27.4	18.3	93	77.3	51.7	153	127.2	85.0	213	177.1	118.3	273	227.0	151.7
34	28.3	18.9	94	78.2	52.2	154	128.0	85.6	214	177.9	118.9	274	227.8	152.2
35	29.1	19.4	95	79.0	52.8	155	128.9	86.1	215	178.8	119.4	275	228.6	152.8
36	29.9	20.0	96	79.8	53.3	156	129.7	86.7	216	179.6	120.0	276	229.5	153.3
37	30.8	20.6	97	80.6	53.9	157	130.5	87.2	217	180.4	120.6	277	230.3	153.9
38	31.6	21.1	98	81.5	54.4	158	131.4	87.8	218	181.3	121.1	278	231.1	154·4
39	32.4	21.7	99	82.3	55.0	159	132.2	88.3	219	182.1	121.7	279	232.0	155.0
40	33.3	22.2	100	83.1	55.6	160	133.0	88.9	220	182.9	122.2	280	232.8	155.6
41	34.1	22.8	101	84.0	56.1	161	133.9	89.4	221	183.7	122.8	281	233.6	156.1
42	34.9	23.3	102	84.8	56.7	162	134.7	90.0	222	184.6	123.3	282	234.5	156.7
43	35.8	23.9	103	85.6	57.2	163	135.5	90.6	223	185.4	123.9	283	235.3	157.2
44	36.6	24.4	104	86.5	57.8	164	136.4	91.1	224	186.2	124.4	284	236.1	157.8
45	37.4	25.0	105	87.3	58.3	165	137.2	91.7	225	187.1	125.0	285	237.0	158.3
46	38.2	25.6	106	88.1	58.9	166	138.0	92.2	226	187.9	125.6	286	237.8	158.9
47	39.1	26.1	107	89.0	59.4	167	138.9	92.8	227	188.7	126.1	287	238.6	159.4
48	39.9	26.7	108	89.8	60.0	168	139.7	93.3	228	189.6	126.7	288	239.5	160.0
49	40.7	27.2	109	90.6	60.6	169	140.5	93.9	229	190.4	127.2	289	240.3	160.6
50	41.6	27.8	110	91.5	61.1	170	141.3	94.4	230	191.2	127.8	290	241.1	161.1
51	42.4	28.3	111	92.3	61.7	171	142.2	95.0	231	192.1	128.3	291	242.0	161.7
52	43.2	28.9	112	93.1	62.2	172	143.0	95.6	232	192.9	128.9	292	242.8	162.2
53	44.1	29.4	113	94.0	62.8	173	143.8	96.1	233	193.7	129.4	293	243.6	162.8
54	44.9	30.0	114	94.8	63.3	174	144.7	96.7	234	194.6	130.0	294	244.4	163.3
55	45.7	30.6	115	95.6	63.9	175	145.5	97.2	235	195.4	130.6	295	245.3	163.9
56	46.6	31.1	116	96.4	64.4	176	146.3	97.8	236	196.2	131.1	296	246.1	164.4
57	47.4	31.7	117	97.3	65.0	177	147.2	98.3	237	197.1	131.7	297	246.9	165.0
58	48.2	32.2	118	98.1	65.6	178	148.0	98.9	238	197.9	132.2	298	247.8	165.6
59	49.1	32.8	119	98.9	66.1	179	148.8	99.4	239	198.7	132.8	299	248.6	166.1
60	49.9	33.3	120	99.8	66.7	180	149.7	100.0	240	199.5	133.3	300	249.4	166.7
Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.

For 5 Points.

TABLE I.

Difference of Latitude and Departure for 3¼ Point.

Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.
1	00.8	00.6	61	49.0	36.3	121	97.2	72.1	181	145.4	107.8	241	193.6	143.6
2	01.6	01.2	62	49.8	36.9	122	98.0	72.7	182	146.2	108.4	242	194.4	144.2
3	02.4	01.8	63	50.6	37.5	123	98.8	73.3	183	147.0	109.0	243	195.2	144.8
4	03.2	02.4	64	51.4	38.1	124	99.6	73.9	184	147.8	109.6	244	196.0	145.4
5	04.0	03.0	65	52.2	38.7	125	100.4	74.5	185	148.6	110.2	245	196.8	146.0
6	04.8	03.6	66	53.0	39.3	126	101.2	75.1	186	149.4	110.8	246	197.6	146.5
7	05.6	04.2	67	53.8	39.9	127	102.0	75.7	187	150.2	111.4	247	198.4	147.1
8	06.4	04.8	68	54.6	40.5	128	102.8	76.3	188	151.0	112.0	248	199.2	147.7
9	07.2	05.4	69	55.4	41.1	129	103.6	76.9	189	151.8	112.6	249	200.0	148.3
10	08.0	06.0	70	56.2	41.7	130	104.4	77.4	190	152.6	113.2	250	200.8	148.9
11	08.8	06.6	71	57.0	42.3	131	105.2	78.0	191	153.4	113.8	251	201.6	149.5
12	09.6	07.1	72	57.8	42.9	132	106.0	78.6	192	154.2	114.4	252	202.4	150.1
13	10.4	07.7	73	58.6	43.5	133	106.8	79.2	193	155.0	115.0	253	203.2	150.7
14	11.2	08.3	74	59.4	44.1	134	107.6	79.8	194	155.8	115.6	254	204.0	151.3
15	12.0	08.9	75	60.2	44.7	135	108.4	80.4	195	156.6	116.2	255	204.8	151.9
16	12.9	09.5	76	61.0	45.3	136	109.2	81.0	196	157.4	116.8	256	205.6	152.5
17	13.7	10.1	77	61.8	45.9	137	110.0	81.6	197	158.2	117.4	257	206.4	153.1
18	14.5	10.7	78	62.6	46.5	138	110.8	82.2	198	159.0	118.0	258	207.2	153.7
19	15.3	11.3	79	63.4	47.1	139	111.6	82.8	199	159.8	118.5	259	208.0	154.3
20	16.1	11.9	80	64.3	47.7	140	112.4	83.4	200	160.6	119.1	260	208.8	154.9
21	16.9	12.5	81	65.1	48.3	141	113.2	84.0	201	161.4	119.7	261	209.6	155.5
22	17.7	13.1	82	65.9	48.9	142	114.0	84.6	202	162.2	120.3	262	210.4	156.1
23	18.5	13.7	83	66.7	49.4	143	114.9	85.2	203	163.0	120.9	263	211.2	156.7
24	19.3	14.3	84	67.5	50.0	144	115.7	85.8	204	163.9	121.5	264	212.0	157.3
25	20.1	14.9	85	68.3	50.6	145	116.5	86.4	205	164.7	122.1	265	212.8	157.9
26	20.9	15.5	86	69.1	51.2	146	117.3	87.0	206	165.5	122.7	266	213.6	158.5
27	21.7	16.1	87	69.9	51.8	147	118.1	87.6	207	166.3	123.3	267	214.5	159.1
28	22.5	16.7	88	70.7	52.4	148	118.9	88.2	208	167.1	123.9	268	215.3	159.6
29	23.3	17.3	89	71.5	53.0	149	119.7	88.8	209	167.9	124.5	269	216.1	160.2
30	24.1	17.9	90	72.3	53.6	150	120.5	89.4	210	168.7	125.1	270	216.9	160.8
31	24.9	18.5	91	73.1	54.2	151	121.3	90.0	211	169.5	125.7	271	217.7	161.4
32	25.7	19.1	92	73.9	54.8	152	122.1	90.5	212	170.3	126.3	272	218.5	162.0
33	26.5	19.7	93	74.7	55.4	153	122.9	91.1	213	171.1	126.9	273	219.3	162.6
34	27.3	20.3	94	75.5	56.0	154	123.7	91.7	214	171.9	127.5	274	220.1	163.2
35	28.1	20.9	95	76.3	56.6	155	124.5	92.3	215	172.7	128.1	275	220.9	163.8
36	28.9	21.4	96	77.1	57.2	156	125.3	92.9	216	173.5	128.7	276	221.7	164.4
37	29.7	22.0	97	77.9	57.8	157	126.1	93.5	217	174.3	129.3	277	222.5	165.0
38	30.5	22.6	98	78.7	58.4	158	126.9	94.1	218	175.1	129.9	278	223.3	165.6
39	31.3	23.2	99	79.5	59.0	159	127.7	94.7	219	175.9	130.5	279	224.1	166.2
40	32.1	23.8	100	80.3	59.6	160	128.5	95.3	220	176.7	131.1	280	224.9	166.8
41	32.9	24.4	101	81.1	60.2	161	129.3	95.9	221	177.5	131.7	281	225.7	167.4
42	33.7	25.0	102	81.9	60.8	162	130.1	96.5	222	178.3	132.2	282	226.5	168.0
43	34.5	25.6	103	82.7	61.4	163	130.9	97.1	223	179.1	132.8	283	227.3	168.6
44	35.3	26.2	104	83.5	62.0	164	131.7	97.7	224	179.9	133.4	284	228.1	169.2
45	36.1	26.8	105	84.3	62.6	165	132.5	98.3	225	180.7	134.0	285	228.9	169.8
46	36.9	27.4	106	85.1	63.1	166	133.3	98.9	226	181.5	134.6	286	229.7	170.4
47	37.7	28.0	107	85.9	63.7	167	134.1	99.5	227	182.3	135.2	287	230.5	171.0
48	38.6	28.6	108	86.7	64.3	168	134.9	100.1	228	183.1	135.8	288	231.3	171.6
49	39.4	29.2	109	87.5	64.9	169	135.7	100.7	229	183.9	136.4	289	232.1	172.2
50	40.2	29.8	110	88.4	65.5	170	136.5	101.3	230	184.7	137.0	290	232.9	172.8
51	41.0	30.4	111	89.2	66.1	171	137.3	101.9	231	185.5	137.6	291	233.7	173.3
52	41.8	31.0	112	90.0	66.7	172	138.1	102.5	232	186.3	138.2	292	234.5	173.9
53	42.6	31.6	113	90.8	67.3	173	138.9	103.1	233	187.1	138.8	293	235.3	174.5
54	43.4	32.2	114	91.6	67.9	174	139.8	103.7	234	187.9	139.4	294	236.1	175.1
55	44.2	32.8	115	92.4	68.5	175	140.6	104.2	235	188.8	140.0	295	236.9	175.7
56	45.0	33.4	116	93.2	69.1	176	141.4	104.8	236	189.6	140.6	296	237.7	176.3
57	45.8	34.0	117	94.0	69.7	177	142.2	105.4	237	190.4	141.2	297	238.5	176.9
58	46.6	34.6	118	94.8	70.3	178	143.0	106.0	238	191.2	141.8	298	239.4	177.5
59	47.4	35.1	119	95.6	70.9	179	143.8	106.6	239	192.0	142.4	299	240.2	178.1
60	48.2	35.7	120	96.4	71.5	180	144.6	107.2	240	192.8	143.0	300	241.0	178.7
Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.

For 4¾ Points.

TABLE I.

Difference of Latitude and Departure for 3½ Point.

Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.
1	00.8	00.6	61	47.1	38.7	121	93.5	76.8	181	139.9	114.8	241	186.3	152.9
2	01.5	01.3	62	47.9	39.3	122	94.3	77.4	182	140.7	115.5	242	187.1	153.5
3	02.3	01.9	63	48.7	40.0	123	95.1	78.0	183	141.5	116.1	243	187.8	154.2
4	03.1	02.5	64	49.5	40.6	124	95.8	78.7	184	142.2	116.7	244	188.6	154.8
5	03.9	03.2	65	50.2	41.2	125	96.6	79.3	185	143.0	117.4	245	189.4	155.4
6	04.6	03.8	66	51.0	41.9	126	97.4	79.9	186	143.8	118.0	246	190.2	156.1
7	05.4	04.4	67	51.8	42.5	127	98.2	80.6	187	144.5	118.6	247	190.9	156.7
8	06.2	05.1	68	52.6	43.1	128	98.9	81.2	188	145.3	119.3	248	191.7	157.3
9	07.0	05.7	69	53.3	43.8	129	99.7	81.8	189	146.1	119.9	249	192.5	158.0
10	07.7	06.3	70	54.1	44.4	130	100.5	82.5	190	146.9	120.5	250	193.2	158.6
11	08.5	07.0	71	54.0	45.0	131	101.3	83.1	191	147.6	121.2	251	194.0	159.2
12	09.3	07.6	72	55.7	45.7	132	102.0	83.7	192	148.4	121.8	252	194.8	159.9
13	10.0	08.2	73	56.4	46.3	133	102.8	84.4	193	149.2	122.4	253	195.6	160.5
14	10.8	08.9	74	57.2	46.9	134	103.6	85.0	194	150.0	123.1	254	196.3	161.1
15	11.6	09.5	75	58.0	47.6	135	104.4	85.6	195	150.7	123.7	255	197.1	161.8
16	12.4	10.1	76	58.7	48.2	136	105.1	86.3	196	151.5	124.3	256	197.9	162.4
17	13.1	10.8	77	59.5	48.8	137	105.9	86.9	197	152.3	125.0	257	198.7	163.0
18	13.9	11.4	78	60.3	49.5	138	106.7	87.5	198	153.1	125.6	258	199.4	163.7
19	14.7	12.0	79	61.1	50.1	139	107.4	88.2	199	153.8	126.2	259	200.2	164.3
20	15.5	12.7	80	61.8	50.7	140	108.2	88.8	200	154.6	126.9	260	201.0	164.9
21	16.2	13.3	81	62.6	51.4	141	109.0	89.4	201	155.4	127.5	261	201.8	165.6
22	17.0	14.0	82	63.4	52.0	142	109.8	90.1	202	156.1	128.1	262	202.5	166.2
23	17.8	14.6	83	64.2	52.7	143	110.5	90.7	203	156.9	128.8	263	203.3	166.8
24	18.6	15.2	84	64.9	53.3	144	111.3	91.3	204	157.7	129.4	264	204.1	167.5
25	19.3	15.9	85	65.7	53.9	145	112.1	92.0	205	158.5	130.0	265	204.8	168.1
26	20.1	16.5	86	66.5	54.6	146	112.9	92.6	206	159.2	130.7	266	205.6	168.7
27	20.9	17.1	87	67.2	55.2	147	113.6	93.3	207	160.0	131.3	267	206.4	169.4
28	21.6	17.8	88	68.0	55.8	148	114.4	93.9	208	160.8	132.0	268	207.2	170.0
29	22.4	18.4	89	68.8	56.5	149	115.2	94.5	209	161.6	132.6	269	207.9	170.6
30	23.2	19.0	90	69.6	57.1	150	115.9	95.2	210	162.3	133.2	270	208.7	171.3
31	24.0	19.7	91	70.3	57.7	151	116.7	95.8	211	163.1	133.9	271	209.5	171.9
32	24.7	20.3	92	71.1	58.4	152	117.5	96.4	212	163.9	134.5	272	210.3	172.6
33	25.5	20.9	93	71.9	59.0	153	118.3	97.1	213	164.6	135.1	273	211.0	173.2
34	26.3	21.6	94	72.7	59.6	154	119.0	97.7	214	165.4	135.8	274	211.8	173.8
35	27.1	22.2	95	73.4	60.3	155	119.8	98.3	215	166.2	136.4	275	212.6	174.5
36	27.8	22.8	96	74.2	60.9	156	120.6	99.0	216	167.0	137.0	276	213.3	175.1
37	28.6	23.5	97	75.0	61.5	157	121.4	99.6	217	167.7	137.7	277	214.1	175.7
38	29.4	24.1	98	75.7	62.2	158	122.1	100.2	218	168.5	138.3	278	214.9	176.4
39	30.1	24.7	99	76.5	62.8	159	122.9	100.9	219	169.3	138.9	279	215.7	177.0
40	30.9	25.4	100	77.3	63.4	160	123.7	101.5	220	170.1	139.6	280	216.4	177.6
41	31.7	26.0	101	78.1	64.1	161	124.4	102.1	221	170.8	140.2	281	217.2	178.3
42	32.5	26.6	102	78.8	64.7	162	125.2	102.8	222	171.6	140.8	282	218.0	178.9
43	33.2	27.3	103	79.6	65.3	163	126.0	103.4	223	172.4	141.5	283	218.8	179.5
44	34.0	27.9	104	80.4	66.0	164	126.8	104.0	224	173.1	142.1	284	219.5	180.2
45	34.8	28.5	105	81.2	66.6	165	127.5	104.7	225	173.9	142.7	285	220.3	180.8
46	35.6	29.2	106	81.9	67.2	166	128.3	105.3	226	174.7	143.4	286	221.1	181.4
47	36.3	29.8	107	82.7	67.9	167	129.1	105.9	227	175.5	144.0	287	221.8	182.1
48	37.1	30.4	108	83.5	68.5	168	129.9	106.6	228	176.2	144.6	288	222.6	182.7
49	37.9	31.1	109	84.3	69.1	169	130.6	107.2	229	177.0	145.3	289	223.4	183.3
50	38.6	31.7	110	85.0	69.8	170	131.4	107.8	230	177.8	145.9	290	224.2	184.0
51	39.4	32.3	111	85.8	70.4	171	132.2	108.5	231	178.6	146.5	291	224.9	184.6
52	40.2	33.0	112	86.6	71.0	172	133.0	109.1	232	179.3	147.2	292	225.7	185.2
53	41.0	33.6	113	87.3	71.7	173	133.7	109.7	233	180.1	147.8	293	226.5	185.9
54	41.7	34.3	114	88.1	72.3	174	134.5	110.4	234	180.9	148.4	294	227.3	186.5
55	42.5	34.9	115	88.9	73.0	175	135.3	111.0	235	181.7	149.1	295	228.0	187.1
56	43.3	35.5	116	89.7	73.6	176	136.0	111.6	236	182.4	149.7	296	228.8	187.8
57	44.1	36.2	117	90.4	74.2	177	136.8	112.3	237	183.2	150.3	297	229.6	188.4
58	44.8	36.8	118	91.2	74.9	178	137.6	112.9	238	184.0	151.0	298	230.4	189.0
59	45.6	37.4	119	92.0	75.5	179	138.4	113.6	239	184.7	151.6	299	231.1	189.7
60	46.4	38.1	120	92.8	76.1	180	139.1	114.2	240	185.5	152.3	300	231.9	190.3
Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat	Dist	Dep.	Lat.

For 4½ Points.

TABLE I.

Difference of Latitude and Departure for 3¾ Points.

Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.
1	00.7	00.7	61	45.2	41.0	121	89.6	81.3	181	134.1	121.5	241	178.6	161.8
2	01.5	01.3	62	45.9	41.6	122	90.4	81.9	182	134.8	122.2	242	179.3	162.5
3	02.2	02.0	63	46.7	42.3	123	91.1	82.6	183	135.6	122.9	243	180.0	163.2
4	03.0	02.7	64	47.4	43.0	124	91.9	83.3	184	136.3	123.6	244	180.8	163.8
5	03.7	03.4	65	48.2	43.6	125	92.6	83.9	185	137.1	124.2	245	181.5	164.5
6	04.4	04.0	66	48.9	44.3	126	93.4	84.6	186	137.8	124.9	246	182.3	165.2
7	05.2	04.7	67	49.6	45.0	127	94.1	85.3	187	138.6	125.6	247	183.0	165.9
8	05.9	05.4	68	50.4	45.7	128	94.8	86.0	188	139.3	126.2	248	183.8	166.5
9	06.7	06.0	69	51.1	46.3	129	95.6	86.6	189	140.0	126.9	249	184.5	167.2
10	07.4	06.7	70	51.9	47.0	130	96.3	87.3	190	140.8	127.6	250	185.2	167.9
11	08.2	07.4	71	52.6	47.7	131	97.1	88.0	191	141.5	128.3	251	186.0	168.5
12	08.9	08.1	72	53.3	48.3	132	97.8	88.6	192	142.3	128.9	252	186.7	169.2
13	09.6	08.7	73	54.1	49.0	133	98.5	89.3	193	143.0	129.6	253	187.5	169.9
14	10.4	09.4	74	54.8	49.7	134	99.3	90.0	194	143.7	130.3	254	188.2	170.6
15	11.1	10.1	75	55.6	50.4	135	100.0	90.7	195	144.5	130.9	255	188.9	171.2
16	11.9	10.7	76	56.3	51.0	136	100.8	91.3	196	145.2	131.6	256	189.7	171.9
17	12.6	11.4	77	57.0	51.7	137	101.5	92.0	197	146.0	132.3	257	190.4	172.6
18	13.3	12.1	78	57.8	52.4	138	102.2	92.7	198	146.7	133.0	258	191.2	173.2
19	14.1	12.8	79	58.5	53.0	139	103.0	93.3	199	147.4	133.6	259	191.9	173.9
20	14.8	13.4	80	59.3	53.7	140	103.7	94.0	200	148.2	134.3	260	192.6	174.6
21	15.6	14.1	81	60.0	54.4	141	104.5	94.7	201	148.9	135.0	261	193.4	175.3
22	16.3	14.8	82	60.8	55.1	142	105.2	95.4	202	149.7	135.6	262	194.1	175.9
23	17.0	15.4	83	61.5	55.7	143	106.0	96.0	203	150.4	136.3	263	194.9	176.6
24	17.8	16.1	84	62.2	56.4	144	106.7	96.7	204	151.1	137.0	264	195.6	177.3
25	18.5	16.8	85	63.0	57.1	145	107.4	97.4	205	151.9	137.7	265	196.3	178.0
26	19.3	17.5	86	63.7	57.7	146	108.2	98.0	206	152.6	138.3	266	197.1	178.6
27	20.0	18.1	87	64.5	58.4	147	108.9	98.7	207	153.4	139.0	267	197.8	179.3
28	20.7	18.8	88	65.2	59.1	148	109.7	99.4	208	154.1	139.7	268	198.6	180.0
29	21.5	19.5	89	65.9	59.8	149	110.4	100.1	209	154.9	140.3	269	199.3	180.6
30	22.2	20.1	90	66.7	60.4	150	111.1	100.7	210	155.6	141.0	270	200.1	181.3
31	23.0	20.8	91	67.4	61.1	151	111.9	101.4	211	156.3	141.7	271	200.8	182.0
32	23.7	21.5	92	68.2	61.8	152	112.6	102.1	212	157.1	142.4	272	201.5	182.7
33	24.4	22.2	93	68.9	62.4	153	113.4	102.7	213	157.8	143.0	273	202.3	183.3
34	25.2	22.8	94	69.6	63.1	154	114.1	103.4	214	158.6	143.7	274	203.0	184.0
35	25.9	23.5	95	70.4	63.8	155	114.8	104.1	215	159.3	144.4	275	203.8	184.7
36	26.7	24.2	96	71.1	64.5	156	115.6	104.8	216	160.0	145.0	276	204.5	185.3
37	27.4	24.8	97	71.9	65.1	157	116.3	105.4	217	160.8	145.7	277	205.2	186.0
38	28.2	25.5	98	72.6	65.8	158	117.1	106.1	218	161.5	146.4	278	206.0	186.7
39	28.9	26.2	99	73.3	66.5	159	117.8	106.8	219	162.3	147.1	279	206.7	187.4
40	29.6	26.9	100	74.1	67.2	160	118.5	107.4	220	163.0	147.7	280	207.5	188.0
41	30.4	27.5	101	74.8	67.8	161	119.3	108.1	221	163.7	148.4	281	208.2	188.7
42	31.1	28.2	102	75.6	68.5	162	120.0	108.8	222	164.5	149.1	282	208.9	189.4
43	31.9	28.9	103	76.3	69.2	163	120.8	109.5	223	165.2	149.7	283	209.7	190.0
44	32.6	29.5	104	77.1	69.8	164	121.5	110.1	224	166.0	150.4	284	210.4	190.7
45	33.3	30.2	105	77.8	70.5	165	122.3	110.8	225	166.7	151.1	285	211.2	191.4
46	34.1	30.9	106	78.5	71.2	166	123.0	111.5	226	167.4	151.8	286	211.9	192.1
47	34.8	31.6	107	79.3	71.8	167	123.7	112.1	227	168.2	152.4	287	212.6	192.7
48	35.6	32.2	108	80.0	72.5	168	124.5	112.8	228	168.9	153.1	288	213.4	193.4
49	36.3	32.9	109	80.8	73.2	169	125.2	113.5	229	169.7	153.8	289	214.1	194.1
50	37.0	33.6	110	81.5	73.9	170	126.0	114.2	230	170.4	154.5	290	214.9	194.7
51	37.8	34.2	111	82.2	74.5	171	126.7	114.8	231	171.2	155.1	291	215.6	195.4
52	38.5	34.9	112	83.0	75.2	172	127.4	115.5	232	171.9	155.8	292	216.4	196.1
53	39.3	35.6	113	83.7	75.9	173	128.2	116.2	233	172.6	156.5	293	217.1	196.8
54	40.0	36.3	114	84.5	76.5	174	128.9	116.8	234	173.4	157.1	294	217.8	197.4
55	40.7	36.9	115	85.2	77.2	175	129.7	117.5	235	174.1	157.8	295	218.6	198.1
56	41.5	37.6	116	85.9	77.9	176	130.4	118.2	236	174.9	158.5	296	219.3	198.8
57	42.2	38.3	117	86.7	78.6	177	131.1	118.9	237	175.6	159.1	297	220.1	199.4
58	43.0	38.9	118	87.4	79.2	178	131.9	119.5	238	176.3	159.8	298	220.8	200.1
59	43.7	39.6	119	88.2	79.9	179	132.6	120.2	239	177.1	160.5	299	221.5	200.8
60	44.5	40.3	120	88.9	80.6	180	133.4	120.9	240	177.8	161.2	300	222.3	201.5
Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.

For 4¼ Points.

TABLE I.

Difference of Latitude and Departure for 4 Points.

Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.
1	00.7	00.7	61	43.1	43.1	121	85.6	85.6	181	128.0	128.0	241	170.4	170.4
2	01.4	01.4	62	43.8	43.8	122	86.3	86.3	182	128.7	128.7	242	171.1	171.1
3	02.1	02.1	63	44.5	44.5	123	87.0	87.0	183	129.4	129.4	243	171.8	171.8
4	02.8	02.8	64	45.3	45.3	124	87.7	87.7	184	130.1	130.1	244	172.5	172.5
5	03.5	03.5	65	46.0	46.0	125	88.4	88.4	185	130.8	130.8	245	173.2	173.2
6	04.2	04.2	66	46.7	46.7	126	89.1	89.1	186	131.5	131.5	246	173.9	173.9
7	04.9	04.9	67	47.4	47.4	127	89.8	89.8	187	132.2	132.2	247	174.7	174.7
8	05.7	05.7	68	48.1	48.1	128	90.5	90.5	188	132.9	132.9	248	175.4	175.4
9	06.4	06.4	69	48.8	48.8	129	91.2	91.2	189	133.6	133.6	249	176.1	176.1
10	07.1	07.1	70	49.5	49.5	130	91.9	91.9	190	134.3	134.3	250	176.8	176.8
11	07.8	07.8	71	50.2	50.2	131	92.6	92.6	191	135.1	135.1	251	177.5	177.5
12	08.5	08.5	72	50.9	50.9	132	93.3	93.3	192	135.8	135.8	252	178.2	178.2
13	09.2	09.2	73	51.6	51.6	133	94.0	94.0	193	136.5	136.5	253	178.9	178.9
14	09.9	09.9	74	52.3	52.3	134	94.8	94.8	194	137.2	137.2	254	179.6	179.6
15	10.6	10.6	75	53.0	53.0	135	95.5	95.5	195	137.9	137.9	255	180.3	180.3
16	11.3	11.3	76	53.7	53.7	136	96.2	96.2	196	138.6	138.6	256	181.0	181.0
17	12.0	12.0	77	54.4	54.4	137	96.9	96.9	197	139.3	139.3	257	181.7	181.7
18	12·7	12.7	78	55.2	55.2	138	97.6	97.6	198	140.0	140.0	258	182.4	182.4
19	13.4	13.4	79	55.9	55.9	139	98.3	98.3	199	140.7	140.7	259	183.1	183.1
20	14.1	14.1	80	56.6	56.6	140	99.0	99.0	200	141.4	141.4	260	183.8	183.8
21	14.8	14.8	81	57.3	57.3	141	99.7	99.7	201	142.1	142.1	261	184.6	184.6
22	15.6	15.6	82	58.0	58.0	142	100.4	100.4	202	142.8	142.8	262	185.3	185.3
23	16.3	16.3	83	58.7	58.7	143	101.1	101.1	203	143.5	143.5	263	186.0	186.0
24	17.0	17.0	84	59.4	59.4	144	101.8	101.8	204	144.2	144.2	264	186.7	186.7
25	17.7	17.7	85	60.1	60.1	145	102.5	102.5	205	145.0	145.0	265	187.4	187.4
26	18.4	18.4	86	60.8	60.8	146	103.2	103.2	206	145.7	145.7	266	188.1	188.1
27	19.1	19.1	87	61.5	61.5	147	103.9	103.9	207	146.4	146.4	267	188.8	188.8
28	19.8	19.8	88	62.2	62.2	148	104.7	104.7	208	147.1	147.1	268	189.5	189.5
29	20.5	20.5	89	62.9	62.9	149	105.4	105.4	209	147.8	147.8	269	190.2	190.2
30	21.2	21.2	90	63.6	63.6	150	106.1	106.1	210	148.5	148.5	270	190.9	190.9
31	21.9	21.9	91	64.3	64.3	151	106.8	106.8	211	149.2	149.2	271	191.6	191.6
32	22.6	22.6	92	65.1	65.1	152	107.5	107.5	212	149.9	149.9	272	192.3	192.3
33	23.3	23.3	93	65.8	65.8	153	108.2	108.2	213	150.6	150.6	273	193.0	193.0
34	24.0	24.0	94	66.5	66.5	154	108.9	108.9	214	151.3	151.3	274	193.7	193.7
35	24.7	24.7	95	67.2	67.2	155	109.6	109.6	215	152.0	152.0	275	194.5	194.5
36	25.5	25.5	96	67.9	67.9	156	110.3	110.3	216	152.7	152.7	276	195.2	195.2
37	26.2	26.2	97	68.6	68.6	157	111.0	111.0	217	153.4	153.4	277	195.9	195.9
38	26.9	26.9	98	69.3	69.3	158	111.7	111.7	218	154.1	154.1	278	196.6	196.6
39	27.6	27.6	99	70.0	70.0	159	112.4	112.4	219	154.9	154.9	279	197.3	197.3
40	28.3	28.3	100	70.7	70.7	160	113.1	113.1	220	155.6	155.6	280	198.0	198.0
41	29.0	29.0	101	71.4	71.4	161	113.8	113.8	221	156.3	156.3	281	198.7	198.7
42	29.7	29.7	102	72.1	72.1	162	114.5	114.5	222	157.0	157.0	282	199.4	199.4
43	30.4	30.4	103	72.8	72.8	163	115.3	115.3	223	157.7	157.7	283	200.1	200.1
44	31.1	31.1	104	73.5	73.5	164	116.0	116.0	224	158.4	158.4	284	200.8	200.8
45	31.8	31.8	105	74.2	74.2	165	116.7	116.7	225	159.1	159.1	285	201.5	201.5
46	32.5	32.5	106	75.0	75.0	166	117.4	117.4	226	159.8	159.8	286	202.2	202.2
47	33.2	33.2	107	75.7	75.7	167	118.1	118.1	227	160.5	160.5	287	202.9	202.9
48	33.9	33.9	108	76.4	76.4	168	118.8	118.8	228	161.2	161.2	288	203.6	203.6
49	34.6	34.6	109	77.1	77.1	169	119.5	119.5	229	161.9	161.9	289	204.3	204.3
50	35.4	35.4	110	77.8	77.8	170	120.2	120.2	230	162.6	162.6	290	205.1	205.1
51	36.1	36.1	111	78.5	78.5	171	120.9	120.9	231	163.3	163.3	291	205.8	205.8
52	36.8	36.8	112	79.2	79.2	172	121.6	121.6	232	164.0	164.0	292	206.5	206.5
53	37.5	37.5	113	79.9	79.9	173	122.3	122.3	233	164.8	164.8	293	207.2	207.2
54	38.2	38.2	114	80.6	80.6	174	123.0	123.0	234	165.5	165.5	294	207.9	207.9
55	38.9	38.9	115	81.3	81.3	175	123.7	123.7	235	166.2	166.2	295	208.6	208.6
56	39.6	39.6	116	82.0	82.0	176	124.4	124.4	236	166.9	166.9	296	209.3	209.3
57	40.3	40.3	117	82·7	82.7	177	125.2	125.2	237	167.6	167.6	297	210.0	210.0
58	41.0	41.0	118	83.4	83.4	178	125.9	125.9	238	168.3	168.3	298	210.7	210.7
59	41.7	41.7	119	84.1	84.1	179	126.6	126.6	239	169.0	169.0	299	211.4	211.4
60	42.4	42.4	120	84.8	84.8	180	127.3	127.3	240	169.7	169.7	300	212.1	212.1
Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.

For 4 Points.

TABLE II.

Difference of Latitude and Departure for 1 Degree.

Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.
1	01.0	00.0	61	61.0	01.1	121	121.0	02.1	181	181.0	03.2	241	241.0	04.2
2	02.0	00.0	62	62.0	01.1	122	122.0	02.1	182	182.0	03.2	242	242.0	04.2
3	03.0	00.1	63	63.0	01.1	123	123.0	02.1	183	183.0	03.2	243	243.0	04.2
4	04.0	00.1	64	64.0	01.1	124	124.0	02.2	184	184.0	03.2	244	244.0	04.3
5	05.0	00.1	65	65.0	01.1	125	125.0	02.2	185	185.0	03.2	245	245.0	04.3
6	06.0	00.1	66	66.0	01.2	126	126.0	02.2	186	186.0	03.2	246	246.0	04.3
7	07.0	00.1	67	67.0	01.2	127	127.0	02.2	187	187.0	03.3	247	247.0	04.3
8	08.0	00.1	68	68.0	01.2	128	128.0	02.2	188	188.0	03.3	248	248.0	04.3
9	09.0	00.2	69	69.0	01.2	129	129.0	02.3	189	189.0	03.3	249	249.0	04.3
10	10.0	00.2	70	70.0	01.2	130	130.0	02.3	190	190.0	03.3	250	250.0	04.4
11	11.0	00.2	71	71.0	01.2	131	131.0	02.3	191	191.0	03.3	251	251.0	04.4
12	12.0	00.2	72	72.0	01.3	132	132.0	02.3	192	192.0	03.4	252	252.0	04.4
13	13.0	00.2	73	73.0	01.3	133	133.0	02.3	193	193.0	03.4	253	253.0	04.4
14	14.0	00.2	74	74.0	01.3	134	134.0	02.3	194	194.0	03.4	254	254.0	04.4
15	15.0	00.3	75	75.0	01.3	135	135.0	02.4	195	195.0	03.4	255	255.0	04.5
16	16.0	00.3	76	76.0	01.3	136	136.0	02.4	196	196.0	03.4	256	256.0	04.5
17	17.0	00.3	77	77.0	01.3	137	137.0	02.4	197	197.0	03.4	257	257.0	04.5
18	18.0	00.3	78	78.0	01.4	138	138.0	02.4	198	198.0	03.5	258	258.0	04.5
19	19.0	00.3	79	79.0	01.4	139	139.0	02.4	199	199.0	03.5	259	259.0	04.5
20	20.0	00.3	80	80.0	01.4	140	140.0	02.4	200	200.0	03.5	260	260.0	04.5
21	21.0	00.4	81	81.0	01.4	141	141.0	02.5	201	201.0	03.5	261	261.0	04.6
22	22.0	00.4	82	82.0	01.4	142	142.0	02.5	202	202.0	03.5	262	262.0	04.6
23	23.0	00.4	83	83.0	01.4	143	143.0	02.5	203	203.0	03.5	263	263.0	04.6
24	24.0	00.4	84	84.0	01.5	144	144.0	02.5	204	204 0	03.6	264	264.0	04.6
25	25.0	00.4	85	85.0	01.5	145	145.0	02.5	205	205.0	03.6	265	265.0	04.6
26	26.0	00.5	86	86.0	01.5	146	146.0	02.5	206	206.0	03.6	266	266.0	04.6
27	27.0	00.5	87	87.0	01.5	147	147.0	02.6	207	207.0	03.6	267	267.0	04.7
28	28.0	00.5	88	88.0	01.5	148	148.0	02.6	208	208.0	03.6	268	268.0	04.7
29	29.0	00.5	89	89.0	01.6	149	149.0	02.6	209	209.0	03.6	269	269.0	04.7
30	30.0	00.5	90	90.0	01.6	150	150.0	02.6	210	210.0	03.7	270	270.0	04.7
31	31.0	00.5	91	91.0	01.6	151	151.0	02.6	211	211.0	03.7	271	271.0	04.7
32	32.0	00.6	92	92.0	01.6	152	152.0	02.7	212	212.0	03.7	272	272.0	04.7
33	33.0	00.6	93	93.0	01.6	153	153.0	02.7	213	213.0	03.7	273	273.0	04.8
34	34.0	00.6	94	94.0	01.6	154	154.0	02.7	214	214.0	03.7	274	274.0	04.8
35	35.0	00.6	95	95.0	01.7	155	155.0	02.7	215	215.0	03.8	275	275.0	04.8
36	36.0	00.6	96	96.0	01.7	156	156.0	02.7	216	216.0	03.8	276	276.0	04.8
37	37.0	00.6	97	97.0	01.7	157	157.0	02.7	217	217.0	03.8	277	277.0	04.8
38	38.0	00.7	98	98.0	01.7	158	158.0	02.8	218	218.0	03.8	278	278.0	04.9
39	39.0	00.7	99	99.0	01.7	159	159.0	02.8	219	219.0	03.8	279	279.0	04.9
40	40.0	00.7	100	100.0	01.7	160	160.0	02.8	220	220.0	03.8	280	280.0	04.9
41	41.0	00.7	101	101.0	01.8	161	161.0	02.8	221	221.0	03.9	281	281.0	04.9
42	42.0	00.7	102	102.0	01.8	162	162.0	02.8	222	222.0	03.9	282	282.0	04.9
43	43.0	00.8	103	103.0	01.8	163	163.0	02.8	223	223.0	03.9	283	283.0	04.9
44	44.0	00.8	104	104.0	01.8	164	164.0	02.9	224	224.0	03.9	284	284.0	05.0
45	45.0	00.8	105	105.0	01.8	165	165.0	02.9	225	225.0	03.9	285	285.0	05.0
46	46.0	00.8	106	106.0	01.8	166	166.0	02.9	226	226.0	03.9	286	286.0	05.0
47	47.0	00.8	107	107.0	01.9	167	167.0	02.9	227	227.0	04.0	287	287.0	05.0
48	48.0	00.8	108	108.0	01.9	168	168.0	02.9	228	228.0	04.0	288	288.0	05.0
49	49.0	00.9	109	109.0	01.9	169	169.0	02.9	229	229.0	04.0	289	289.0	05.0
50	50.0	00.9	110	110.0	01.9	170	170.0	03.0	230	230.0	04.0	290	290.0	05.1
51	51.0	00.9	111	111.0	01.9	171	171.0	03.0	231	231.0	04.0	291	291.0	05.1
52	52.0	00.9	112	112.0	02.0	172	172.0	03.0	232	232.0	04.0	292	292.0	05.1
53	53.0	00.9	113	113.0	02.0	173	173.0	03.0	233	233.0	04.1	293	293.0	05.1
54	54.0	00.9	114	114.0	02.0	174	174.0	03.0	234	234.0	04.1	294	294.0	05.1
55	55.0	01.0	115	115.0	02.0	175	175.0	03.1	235	235.0	04.1	295	295.0	05.1
56	56.0	01.0	116	116.0	02.0	176	176.0	03.1	236	236.0	04.1	296	296.0	05.2
57	57.0	01.0	117	117.0	02.0	177	177.0	03.1	237	237.0	04.1	207	297.0	05.2
58	58.0	01.0	118	118.0	02.1	178	178.0	03.1	238	238.0	04.2	298	298.0	05.2
59	59.0	01.0	119	119.0	02.1	179	179.0	03.1	239	239.0	04.2	299	299.0	05.2
60	60.0	01.0	120	120.0	02.1	180	180.0	03.1	240	240.0	04.2	300	300.0	05.2
Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.

For 89 Degrees.

TABLE II.

Difference of Latitude and Departure for 2 Degrees.

Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.
1	01.0	00.0	61	61.0	02.1	121	120.9	04.2	181	180.9	06.3	241	240.9	08.4
2	02.0	00.1	62	62.0	02.2	122	121.9	04.3	182	181.9	06.4	242	241.9	08.4
3	03.0	00.1	63	63.0	02.2	123	122.9	04.3	183	182.9	06.4	243	242.9	08.5
4	04.0	00.1	64	64.0	02.2	124	123.9	04.3	184	183.9	06.4	244	243.9	08.5
5	05.0	00.2	65	65.0	02.3	125	124.9	04.4	185	184.9	06.5	245	244.9	08.6
6	06.0	00.2	66	66.0	02.3	126	125.9	04.4	186	185.9	06.5	246	245.8	08.6
7	07.0	00.2	67	67.0	02.3	127	126.9	04.4	187	186.9	06.5	247	246.8	08.6
8	08.0	00.3	68	68.0	02.4	128	127.9	04.5	188	187.9	06.6	248	247.8	08.7
9	09.0	00.3	69	69.0	02.4	129	128.9	04.5	189	188.9	06.6	249	248.8	08.7
10	10.0	00.3	70	70.0	02.4	130	129.9	04.5	190	189.9	06.6	250	249.8	08.7
11	11.0	00.4	71	71.0	02.5	131	130.9	04.6	191	190.9	06.7	251	250.8	08.8
12	12.0	00.4	72	72.0	02.5	132	131.9	04.6	192	191.9	06.7	252	251.8	08.8
13	13.0	00.5	73	73.0	02.5	133	132.9	04.6	193	192.9	06.7	253	252.8	08.8
14	14.0	00.5	74	74.0	02.6	134	133.9	04.7	194	193.9	06.8	254	253.8	08.9
15	15.0	00.5	75	75.0	02.6	135	134.9	04.7	195	194.9	06.8	255	254.8	08.9
16	16.0	00.6	76	76.0	02.7	136	135.9	04.7	196	195.9	06.8	256	255.8	08.9
17	17.0	00.6	77	77.0	02.7	137	136.9	04.8	197	196.9	06.9	257	256.8	09.0
18	18.0	00.6	78	78.0	02.7	138	137.9	04.8	198	197.9	06.9	258	257.8	09.0
19	19.0	00.7	79	79.0	02.8	139	138.9	04.9	199	198.9	06.9	259	258.8	09.0
20	20.0	00.7	80	80.0	02.8	140	139.9	04.9	200	199.9	07.0	260	259.8	09.1
21	21.0	00.7	81	81.0	02.8	141	140.9	04.9	201	200.9	07.0	261	260.8	09.1
22	22.0	00.8	82	81.9	02.9	142	141.9	05.0	202	201.9	07.0	262	261.8	09.1
23	23.0	00.8	83	82.9	02.9	143	142.9	05.0	203	202.9	07.1	263	262.8	09.2
24	21.0	00.8	84	83.9	02.9	144	143.9	05.0	204	203.9	07.1	264	263.8	09.2
25	25.0	00.9	85	84.9	03.0	145	144.9	05.1	205	204.9	07.2	265	264.8	09.2
26	26.0	00.9	86	85.9	03.0	146	145.9	05.1	206	205.9	07.2	266	265.8	09.3
27	27.0	00.9	87	86.9	03.0	147	146.9	05.1	207	206.9	07.2	267	266.8	09.3
28	28.0	01.0	88	87.9	03.1	148	147.9	05.2	208	207.9	07.3	268	267.8	09.4
29	29.0	01.0	89	88.9	03.1	149	148.9	05.2	209	208.9	07.3	269	268.8	09.4
30	30.0	01.0	90	89.9	03.1	150	149.9	05.2	210	209.9	07.3	270	269.8	09.4
31	31.0	01.1	91	90.9	03.2	151	150.9	05.3	211	210.9	07.4	271	270.8	09.5
32	32.0	01.1	92	91.9	03.2	152	151.9	05.3	212	211.9	07.4	272	271.8	09.5
33	33.0	01.2	93	92.9	03.2	153	152.9	05.3	213	212.9	07.4	273	272.8	09.5
34	34.0	01.2	94	93.9	03.3	154	153.9	05.4	214	213.9	07.5	274	273.8	09.6
35	35.0	01.2	95	94.9	03.3	155	154.9	05.4	215	214.9	07.5	275	274.8	09.6
36	36.0	01.3	96	95.9	03.4	156	155.9	05.4	216	215.9	07.5	276	275.8	09.6
37	37.0	01.3	97	96.9	03.4	157	156.9	05.5	217	216.9	07.6	277	276.8	09.7
38	38.0	01.3	98	97.9	03.4	158	157.9	05.5	218	217.9	07.6	278	277.8	09.7
39	39.0	01.4	99	98.9	03.5	159	158.9	05.5	219	218.9	07.6	279	278.8	09.7
40	40.0	01.4	100	99.9	03.5	160	159.9	05.6	220	219.9	07.7	280	279.8	09.8
41	41.0	01.4	101	100.9	03.5	161	160.9	05.6	221	220.9	07.7	281	280.8	09.8
42	42.0	01.5	102	101.9	03.6	162	161.9	05.7	222	221.9	07.7	282	281.8	09.8
43	43.0	01.5	103	102.9	03.6	163	162.9	05.7	223	222.9	07.8	283	282.8	09.9
44	44.0	01.5	104	103.9	03.6	164	163.9	05.7	224	223.9	07.8	284	283.8	09.9
45	45.0	01.6	105	104.9	03.7	165	164.9	05.8	225	224.9	07.9	285	284.8	09.9
46	46.0	01.6	106	105.9	03.7	166	165.9	05.8	226	225.9	07.9	286	285.8	10.0
47	47.0	01.6	107	106.9	03.7	167	166.9	05.8	227	226.9	07.9	287	286.8	10.0
48	48.0	01.7	108	107.9	03.8	168	167.9	05.9	228	227.9	08.0	288	287.8	10.1
49	49.0	01.7	109	108.9	03.8	169	168.9	05.9	229	228.9	08.0	289	288.8	10.1
50	50.0	01.7	110	109.9	03.8	170	169.9	05.9	230	229.9	08.0	290	289.8	10.1
51	51.0	01.8	111	110.9	03.9	171	170.9	06.0	231	230.9	08.1	291	290.8	10.2
52	52.0	01.8	112	111.9	03.9	172	171.9	06.0	232	231.9	08.1	292	291.8	10.2
53	53.0	01.8	113	112.9	03.9	173	172.9	06.0	233	232.9	08.1	293	292.8	10.2
54	54.0	01.9	114	113.9	04.0	174	173.9	06.1	234	233.9	08.2	294	293.8	10.3
55	55.0	01.9	115	114.9	04.0	175	174.9	06.1	235	234.9	08.2	295	294.8	10.3
56	56.0	02.0	116	115.9	04.0	176	175.9	06.1	236	235.9	08.2	296	295.8	10.3
57	57.0	02.0	117	116.9	04.1	177	176.9	06.2	237	236.9	08.3	297	296.8	10.4
58	58.0	02.0	118	117.9	04.1	178	177.9	06.2	238	237.9	08.3	298	297.8	10.4
59	59.0	02.1	119	118.9	04.2	179	178.9	06.2	239	238.9	08.3	299	298.8	10.4
60	60.0	02.1	120	119.9	04.2	180	179.9	06.3	240	239.9	08.4	300	299.8	10.5
Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.

For 88 Degrees.

TABLE II.

Difference of Latitude and Departure for 3 Degrees.

Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat	Dep.	Dist	Lat.	Dep.
1	01.0	00.1	61	60.9	03.2	121	120.8	06.3	181	180.8	09.5	241	240.7	12.6
2	02.0	00.1	62	61.9	03.2	122	121.8	06.4	182	181.8	09.5	242	241.7	12.7
3	03.0	00.2	63	62.9	03.3	123	122.8	06.4	183	182.7	09.6	243	242.7	12.7
4	04.0	00.2	64	63.9	03.3	124	123.8	06.5	184	183.7	09.6	244	243.7	12.8
5	05.0	00.3	65	64.9	03.4	125	124.8	06.5	185	184.7	09.7	245	344.7	12.8
6	06.0	00.3	66	65.9	03.5	126	125.8	06.6	186	185.7	09.7	246	245.7	12.9
7	07.0	00.4	67	66.9	03.5	127	126.8	06.6	187	186.7	09.8	247	246.7	12.9
8	08.0	00.4	68	67.9	03.6	128	127.8	06.7	188	187.7	09.8	248	247.7	13.0
9	09.0	00.5	69	68.9	03.6	129	128.8	06.8	189	188.7	09.9	249	248.7	13.0
10	10.0	00.5	70	69.9	03.7	130	129.8	06.8	190	189.7	09.9	250	249.7	13.1
11	11.0	00.6	71	70.9	03.7	131	130.8	06.9	191	190.7	10.0	251	250.7	13.1
12	12.0	00.6	72	71.9	03.8	132	131.8	06.9	192	191.7	10.0	252	251.7	13.2
13	13.0	00.7	73	72.9	03.8	133	132.8	07.0	193	192.7	10.1	253	252.7	13.2
14	14.0	00.7	74	73.9	03.9	134	133.8	07.0	194	193.7	10.2	254	253.7	13.3
15	15.0	00.8	75	74.9	03.9	135	134.8	07.1	195	194.7	10.2	255	254.7	13.3
16	16.0	00.8	76	75.9	04.0	136	135.8	07.1	196	195.7	10.3	256	255.6	13.4
17	17.0	00.9	77	76.9	04.0	137	136.8	07.2	197	196.7	10.3	257	256.6	13.5
18	18.0	00.9	78	77.9	04.1	138	137.8	07.2	198	197.7	10.4	258	257.6	13.5
19	19.0	01.0	79	78.9	04.1	139	138.8	07.3	199	198.7	10.4	259	258.6	13.6
20	20.0	01.0	80	79.9	04.2	140	139.8	07.3	200	199.7	10.5	260	259.6	13.6
21	21.0	01.1	81	80.9	04.2	141	140.8	07.4	201	200.7	10.5	261	260.6	13.7
22	22.0	91.2	82	81.9	04.3	142	141.8	07.4	202	201.7	10.6	262	261.6	13.7
23	23.0	01.2	83	82.9	04.3	143	142.8	07.5	203	202.7	10.6	263	262.6	13.8
24	24.0	01.3	84	83.9	04.4	144	143.8	07.5	204	203.7	10.7	264	263.6	13.8
25	25.0	01.3	85	84.9	04.4	145	144.8	07.6	205	204.7	10.7	265	264.6	13.9
26	26.0	01.4	86	85.9	04.5	146	145.8	07.6	206	205.7	10.8	266	265.6	13.9
27	27.0	01.4	87	86.9	04.6	147	146.8	07.7	207	206.7	10.8	267	266.6	14.0
28	28.0	01.5	88	87.9	04.6	148	147.8	07.7	208	207.7	10.9	268	267.6	14.0
29	29.0	01.5	89	88.9	04.7	149	148.8	07.8	209	208.7	10.9	269	268.6	14.1
30	30.0	01.6	90	89.9	04.7	150	149.8	07.9	210	209.7	11.0	270	269.6	14.1
31	31.0	01.6	91	90.9	04.8	151	150.8	07.9	211	210.7	11.0	271	270.6	14.2
32	32.0	01.7	92	91.9	04.8	152	151.8	08.0	212	211.7	11.1	272	271.6	14.2
33	33.0	01.7	93	92.9	04.9	153	152.8	08.0	213	212.7	11.1	273	272.6	14.3
34	34.0	01.8	94	93.9	04.9	154	153.8	08.1	214	213.7	11.2	274	273.6	14.3
35	35.0	01.8	95	94.9	05.0	155	154.8	08.1	215	214.7	11.3	275	274.6	14.4
36	36.0	01.9	96	95.9	05.0	156	155.8	08.2	216	215.7	11.3	276	275.6	14.4
37	36.9	01.9	97	96.9	05.1	157	156.8	08.2	217	216.7	11.4	277	276.6	14.5
38	37.9	02.0	98	97.9	05.1	158	157.8	08.3	218	217.7	11.4	278	277.6	14.5
39	38.9	02.0	99	98.9	05.2	159	158.8	08.3	219	218.7	11.5	279	278.6	14.6
40	39.9	02.1	100	99.9	05.2	160	159.8	08.4	220	219.7	11.5	280	279.6	14·7
41	40.9	02.1	101	100.9	05.3	161	160.8	08.4	221	220.7	11.6	281	280.6	14.7
42	41.9	02.2	102	101.9	05.3	162	161.8	08.5	222	221.7	11.6	282	281.6	14.8
43	42.9	02.3	103	102.9	05.4	163	162.8	08.5	223	222.7	11.7	283	282.6	14.8
44	43.9	02.3	104	103.9	05.4	164	163.8	08.6	224	223.7	11.7	284	283.6	14.9
45	44.9	02.4	105	104.9	05.5	165	164.8	08.6	225	224.7	11.8	285	284.6	14.9
46	45.9	02.4	106	105.9	05.5	166	165.8	08.7	226	225.7	11.8	286	285.6	15.0
47	46.9	02.5	107	106.9	05.6	167	166.8	08.7	227	226.7	11.9	287	286.6	15.0
48	47.9	02.5	108	107.9	05.7	168	167.8	08.8	228	227.7	11.9	288	287.6	15.1
49	48.9	02.6	109	108.9	05.7	169	168.8	08.8	229	228.7	12.0	289	288.6	15.1
50	49.9	02.6	110	109.8	05.8	170	169.8	08.9	230	229.7	12.0	290	289.6	15.2
51	50.9	02.7	111	110.8	05.8	171	170.8	08.9	231	230.7	12.1	291	290.6	15.2
52	51.9	02.7	112	111.8	05.9	172	171.8	09.0	232	231.7	12.1	292	291.6	15.3
53	52.9	02.8	113	112.8	05.9	173	172.8	09.1	233	232.7	12.2	293	292.6	15.3
54	53.9	02.8	114	113.8	06.0	174	173.8	09.1	234	233.7	12.2	294	293.6	15.4
55	54.9	02.9	115	114.8	06.0	175	174.8	09.2	235	234.7	12.3	295	294.6	15.4
56	55.9	02.9	116	115.8	06.1	176	175.8	09.2	236	235.7	12.4	296	295.6	15.5
57	56.9	03.0	117	116.8	06.1	177	176.8	09.3	237	236.7	12.4	297	296.6	15.5
58	57.9	03.0	118	117.8	06.2	178	177.8	09.3	238	237.7	12.5	298	297.6	15.6
59	58.9	03.1	119	118.8	06.2	179	178.8	09.4	239	238.7	12.5	299	298.6	15.6
60	59.9	03.1	220	119.8	06.3	180	179.8	09.4	240	239.7	12.6	300	299.6	15·7
Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.

For 87 Degrees.

TABLE II.

Difference of Latitude and Departure for 4 Degrees.

Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.
1	01.0	00.1	61	60.9	04.3	121	120.7	08.4	181	180.6	12.6	241	240.4	16.8
2	02.0	00.1	62	61.8	04.3	122	121.7	08.5	182	181.6	12.7	242	241.4	16.9
3	03.0	00.2	63	62.8	04.4	123	122.7	08.6	183	182.6	12.8	243	242.4	17.0
4	04.0	00.3	64	63.8	04.5	124	123.7	08.6	184	183.6	12.8	244	243.4	17.0
5	05.0	00.3	65	64.8	04.5	125	124.7	08.7	185	184.5	12.9	245	244.4	17.1
6	06.0	00.4	66	65.8	04.6	126	125.7	08.8	186	185.5	13.0	246	245.4	17.2
7	07.0	00.5	67	66.8	04.7	127	126.7	08.9	187	186.5	13.0	247	246.4	17.2
8	08.0	00.6	68	67.8	04.7	128	127.7	08.9	188	187.5	13.1	248	247.4	17.3
9	09.0	00.6	69	68.8	04.8	129	128.7	09.0	189	188.5	13.2	249	248.4	17.4
10	10.0	00.7	70	69.8	04.9	130	129.7	09.1	190	189.5	13.3	250	249.4	17.4
11	11.0	00.8	71	70.8	05.0	131	130.7	09.1	191	190.5	13.3	251	250.4	17.5
12	12.0	00.8	72	71.8	05.0	132	131.7	09.2	192	191.5	13.4	252	251.4	17.6
13	13.0	00.9	73	72.8	05.1	133	132.7	09.3	193	192.5	13.5	253	252.4	17.6
14	14.0	01.0	74	73.8	05.2	134	133.7	09.3	194	193.5	13.5	254	253.4	17.7
15	15.0	01.0	75	74.8	05.2	135	134.7	09.4	195	194.5	13.6	255	254.4	17.8
16	16.0	01.1	76	75.8	05.3	136	135.7	09.5	196	195.5	13.7	256	255.4	17.9
17	17.0	01.2	77	76.8	05.4	137	136.4	09.6	197	196.5	13.7	257	256.4	17.9
18	18.0	01.3	78	77.8	05.4	138	137.7	09.6	198	197.5	13.8	258	257.4	18.0
19	19.0	01.3	79	78.8	05.5	139	138.7	09.7	199	198.5	13.9	259	258.4	18.1
20	20.0	01.4	80	79.8	05.6	140	139.7	09.8	200	199.5	14.0	260	259.4	18.1
21	20.9	01.5	81	80.8	05.7	141	140.7	09.8	201	200.5	14.0	261	260.4	18.2
22	21.9	01.5	82	81.8	05.7	142	141.7	09.9	202	201.5	14.1	262	261.4	18.3
23	22.9	01.6	83	82.8	05.8	143	142.7	10.0	203	202.5	14.2	263	262.4	18.3
24	23.9	01.7	84	83.8	05.9	144	143.6	10.0	204	203.5	14.2	264	263.4	18.4
25	24.9	01.7	85	84.8	05.9	145	144.6	10.1	205	204.5	14.3	265	264.4	18.5
26	25.9	01.8	86	85.8	06.0	146	145.6	10.2	206	205.5	14.4	266	265.4	18.6
27	26.9	01.9	87	86.8	06.1	147	146.6	10.3	207	206.5	14.4	267	266.3	18.6
28	27.9	02.0	88	87.8	06.1	148	147.6	10.3	208	207.5	14.5	268	267.3	18.7
29	28.9	02.0	89	88.8	06.2	149	148.6	10.4	209	208.5	14.6	269	268.3	18.8
30	29.9	02.1	90	89.8	06.3	150	149.6	10.5	210	209.5	14.6	270	269.3	18.8
31	30.9	02.2	91	90.8	06.3	151	150.6	10.5	211	210.5	14.7	271	270.3	18.9
32	31.9	02.2	92	91.8	06.4	152	151.6	10.6	212	211.5	14.8	272	271.3	19.0
33	32.9	02.3	93	92.8	06.5	153	152.6	10.7	213	212.5	14.9	273	272.3	19.0
34	33.9	02.4	94	93.8	06.6	154	153.6	10.7	214	213.5	14.9	274	273.3	19.1
35	34.9	02.4	95	94.8	06.6	155	154.6	10.8	215	214.5	15.0	275	274.3	19.2
36	35.9	02.5	96	95.8	06.7	156	155.6	10.9	216	215.5	15.1	276	275.3	19.3
37	36.9	02.6	97	96.8	06.8	157	156.6	11.0	217	216.5	15.1	277	276.3	19.3
38	37.9	02.7	98	97.8	06.8	158	157.6	11.0	218	217.5	15.2	278	277.3	19.4
39	38.9	02.7	99	98.8	06.9	159	158.6	11.1	219	218.5	15.3	279	278.3	19.5
40	39.9	02.8	100	99.8	07.0	160	159.6	11.2	220	219.5	15.3	280	279.3	19.5
41	40.9	02.9	101	100.8	07.0	161	160.6	11.2	221	220.5	15.4	281	280.3	19.6
42	41.9	02.9	102	101.8	07.1	162	161.6	11.3	222	221.5	15.5	282	281.3	19.7
43	42.9	03.0	103	102.7	07.2	163	162.6	11.4	223	222.5	15.6	283	282.3	19.7
44	43.9	03.1	104	103.7	07.3	164	163.6	11.4	224	223.5	15.6	284	283.3	19.8
45	44.9	03.1	105	104.7	07.3	165	164.6	11.5	225	224.5	15.7	285	284.3	19.9
46	45.9	03.2	106	105.7	07.4	166	165.6	11.6	226	225.4	15.8	286	285.3	20.0
47	46.9	03.3	107	106.7	07.5	167	166.6	11.6	227	226.4	15.8	287	286.3	20.0
48	47.9	03.3	108	107.7	07.5	168	167.6	11.7	228	227.4	15.9	288	287.3	20.1
49	48.9	03.4	109	108.7	07.6	169	168.6	11.8	229	228.4	16.0	289	288.3	20.2
50	49.9	03.5	110	109.7	07.7	170	169.6	11.9	230	229.4	16.0	290	289.3	20.2
51	50.9	03.6	111	110.7	07.7	171	170.6	11.9	231	230.4	16.1	291	290.3	20.3
52	51.9	03.6	112	111.7	07.8	172	171.6	12.0	232	231.4	16.2	292	291.3	20.4
53	52.9	03.7	113	112.7	07.9	173	172.6	12.1	233	232.4	16.3	293	292.3	20.4
54	53.9	03.8	114	113.7	08.0	174	173.6	12.1	234	233.4	16.3	294	293.3	20.5
55	54.9	03.8	115	114.7	08.0	175	174.6	12.2	235	234.4	16.4	295	294.3	20.6
56	55.9	03.9	116	115.7	08.1	176	175.6	12.3	236	235.4	16.5	296	295.3	20.6
57	56.9	04.0	117	116.7	08.2	177	176.6	12.3	237	236.4	16.5	297	296.3	20.7
58	57.9	04.0	118	117.7	08.2	178	177.6	12.4	238	237.4	16.6	298	297.3	20.8
59	58.9	04.1	119	118.7	08.3	179	178.6	12.5	239	238.4	16.7	299	298.3	20.9
60	59.9	04.2	120	119.7	08.4	180	179.6	12.6	240	239.4	16.7	300	299.3	20.9
Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.

For 86 Degrees.

TABLE II.

Difference of Latitude and Departure for 5 Degrees.

Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.
1	01.0	00.1	61	60.8	05.3	121	120.5	10.5	181	180.3	15.8	241	240.1	21.0
2	02.0	00.2	62	61.8	05.4	122	121.5	10.6	182	181.3	15.9	242	241.1	21.1
3	03.0	00.3	63	62.8	05.5	123	122.5	10.7	183	182.3	15.9	243	242.1	21.2
4	04.0	00.3	64	63.8	05.6	124	123.5	10.8	184	183.3	16.0	244	243.1	21.3
5	05.0	00.4	65	64.8	05.7	125	124.5	10.9	185	184.3	16.1	245	244.1	21.4
6	06.0	00.5	66	65.7	05.8	126	125.5	11.0	186	185.3	16.2	246	245.1	21.4
7	07.0	00.6	67	66.7	05.8	127	126.5	11.1	187	186.3	16.3	247	246.1	21.5
8	08.0	00.7	68	67.7	05.9	128	127.5	11.2	188	187.3	16.4	248	247.1	21.6
9	09.0	00.8	69	68.7	06.0	129	128.5	11.2	189	188.3	16.5	249	248.1	21.7
10	10.0	00.9	70	69.7	06.1	130	129.5	11.3	190	189.3	16.6	250	249.0	21.8
11	11.0	01.0	71	70.7	06.2	131	130.5	11.4	191	190.3	16.6	251	250.0	21.9
12	12.0	01.0	72	71.7	06.3	132	131.5	11.5	192	191.3	16.7	252	251.0	22.0
13	13.0	01.1	73	72.7	06.4	133	132.5	11.6	193	192.3	16.8	253	252.0	22.1
14	13.9	01.2	74	73.7	06.4	134	133.5	11.7	194	193.3	16.9	254	253.0	22.1
15	14.9	01.3	75	74.7	06.5	135	134.5	11.8	195	194.3	17.0	255	254.0	22.2
16	15.9	01.4	76	75.7	06.6	136	135.5	11.9	196	195.3	17.1	256	255.0	22.3
17	16.9	01.5	77	76.7	06.7	137	136.5	11.9	197	196.3	17.2	257	256.0	22.4
18	17.9	01.6	78	77.7	06.8	138	137.5	12.0	198	197.2	17.3	258	257.0	22.5
19	18.9	01.7	79	78.7	06.9	139	138.5	12.1	199	198.2	17.3	259	258.0	22.6
20	19.9	01.7	80	79.7	07.0	140	139.5	12.2	200	199.2	17.4	260	259.0	22.7
21	20.9	01.8	81	80.7	07.1	141	140.5	12.3	201	200.2	17.5	261	260.0	22.7
22	21.9	01.9	82	81.7	07.1	142	141.5	12.4	202	201.2	17.6	262	261.0	22.8
23	22.9	02.0	83	82.7	07.2	143	142.5	12.5	203	202.2	17.7	263	262.0	22.9
24	23.9	02.1	84	83.7	07.3	144	143.5	12.6	204	203.2	17.8	264	263.0	23.0
25	24.9	02.2	85	84.7	07.4	145	144.4	12.6	205	204.2	17.9	265	264.0	23.1
26	25.9	02.3	86	85.7	07.5	146	145.4	12.7	206	205.2	18.0	266	265.0	23.2
27	26.9	02.4	87	86.7	07.6	147	146.4	12.8	207	206.2	18.0	267	266.0	23.3
28	27.9	02.4	88	87.7	07.7	148	147.4	12.9	208	207.2	18.1	268	267.0	23.4
29	28.9	02.5	89	88.7	07.8	149	148.4	13.0	209	208.2	18.2	269	268.0	23.4
30	29.9	02.6	90	89.7	07.8	150	149.4	13.1	210	209.2	18.3	270	269.0	23.5
31	30.9	02.7	91	90.7	07.9	151	150.4	13.2	211	210.2	18.4	271	270.0	23.6
32	31.9	02.8	92	91.6	08.0	152	151.4	13.2	212	211.2	18.5	272	271.0	23.7
33	32.9	02.9	93	92.6	08.1	153	152.4	13.3	213	212.2	18.6	273	272.0	23.8
34	33.9	03.0	94	93.6	08.2	154	153.4	13.4	214	213.2	18.7	274	273.0	23.9
35	34.9	03.1	95	94.6	08.3	155	154.4	13.5	215	214.2	18.7	275	274.0	24.0
36	35.9	03.1	96	95.6	08.4	156	155.4	13.6	216	215.2	18.8	276	274.9	24.1
37	36.9	03.2	97	96.6	08.5	157	156.4	13.7	217	216.2	18.9	277	275.9	24.1
38	37.9	03.3	98	97.6	08.5	158	157.4	13.8	218	217.2	19.0	278	276.9	24.2
39	38.9	03.4	99	98.6	08.6	159	158.4	13.9	219	218.2	19.1	279	277.9	24.3
40	39.8	03.5	100	99.6	08.7	160	159.4	13.9	220	219.2	19.2	280	278.9	24.4
41	40.8	03.6	101	100.6	08.8	161	160.4	14.0	221	220.2	19.3	281	279.9	24.5
42	41·8	03.7	102	101.6	08.9	162	161.4	14.1	222	221.2	19.3	282	280.9	24.6
43	42.8	03.7	103	102.6	09.0	163	162.4	14.2	223	222.2	19.4	283	281.9	24.7
44	43.8	03.8	104	103.6	09.1	164	163.4	14.3	224	223.1	19.5	284	282.9	24.8
45	44.8	03.9	105	104.6	09.2	165	164.4	14.4	225	224.1	19.6	285	283.9	24.8
46	45.8	04.0	106	105.6	09.2	166	165.4	14.5	226	225.1	19.7	286	284.9	24.9
47	46.8	04.1	107	106.6	09.3	167	166.4	14.6	227	226.1	19.8	287	285.9	25.0
48	47.8	04.2	108	107.6	09.4	168	167.4	14.6	228	227.1	19.9	288	286.9	25.1
49	48.8	04.3	109	108.6	09.5	169	168.4	14.7	229	228.1	20.0	289	287.9	25.2
50	49.8	04.4	110	109.6	09.6	170	169.4	14.8	230	229.1	20.0	290	288.9	25.3
51	50.8	04.4	111	110.6	09.7	171	170.3	14.9	231	230.1	20.1	291	289.9	25.4
52	51.8	04.5	112	111.6	09.8	172	171.3	15.0	232	231.1	20.2	292	290.9	25.4
53	52.8	04.6	113	112.6	09.8	173	172.3	15.1	233	232.1	20.3	293	291.9	25.5
54	53.8	04.7	114	113.6	09.9	174	173.3	15.2	234	233.1	20.4	294	292.9	25.6
55	54.8	04.8	115	114.6	10.0	175	174.3	15.3	235	234.1	20.5	295	293.9	25.7
56	55.8	04.9	116	115.6	10.1	176	175.3	15.3	236	235.1	20.6	296	294.9	25.8
57	56.8	05.0	117	116.6	10.2	177	176.3	15.4	237	236.1	20.7	297	295.9	25.9
58	57.8	05.1	118	117.6	10.3	178	177.3	15.5	238	237.1	20.7	298	296.9	26.0
59	58.8	05.1	119	118.5	10.4	179	178.3	15.6	239	238.1	20.8	299	297.9	26.1
60	59.8	05.2	120	119.5	10.5	180	179.3	15.7	240	239.1	20.9	300	298.9	26.1
Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat	Dist	Dep.	Lat.

For 85 Degrees.

TABLE II.

Difference of Latitude and Departure for 6 Degrees.

Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep
1	01.0	00.1	61	60.7	06.4	121	120.3	12.6	181	180.0	18.9	241	239.7	25.2
2	02.0	06.2	62	61.7	06.5	122	121.3	12.8	182	181.0	19.0	242	240.7	25.3
3	03.0	00.3	63	62.7	06.6	123	122.3	12.9	183	182.0	19.1	243	241.7	25.4
4	04.0	00.4	64	63.6	06.7	124	123.3	13.0	184	183.0	19.2	244	242.7	25.5
5	05.0	00.5	65	64.6	06.8	125	124.3	13.1	185	184.0	19.3	245	243.7	25.6
6	06.0	00.6	66	65.6	06.9	126	125.3	13.2	186	185.0	19.4	246	244.7	25.7
7	07.0	00.7	67	66.6	07.0	127	126.3	13.3	187	186.0	19.5	247	245.6	25.8
8	08.0	00.8	68	67.6	07.1	128	127.3	13.4	188	187.0	19.7	248	246.6	25.9
9	09.0	00.9	69	68.6	07.2	129	128.3	13.5	189	188.0	19.8	249	247.6	26.0
10	09.9	01.0	70	69.6	07.3	130	129.3	13.6	190	189.0	19.9	250	248.6	26.1
11	10.9	01.1	71	70.6	07.4	131	130.3	13.7	191	190.0	20.0	251	249.6	26.2
12	11.9	01.3	72	71.6	07.5	132	131.3	13.8	192	190.9	20.1	252	250.6	26.3
13	12.9	01.4	73	72.6	07.6	133	132.3	13.9	193	191.9	20.2	253	251.6	26.4
14	13.9	01.5	74	73.6	07.7	134	133.3	14.0	194	192.9	20.3	254	252.6	26.6
15	14.9	01.6	75	74.6	07.8	135	134.3	14.1	195	193.9	20.4	255	253.6	26.7
16	15.9	01.7	76	75.6	07.9	136	135.3	14.2	196	194.9	20.5	256	254.6	26.8
17	16.9	01.8	77	76.6	08.0	137	136.2	14.3	197	195.9	20.6	257	255.6	26.9
18	17.9	01.9	78	77.6	08.2	138	137.2	14.4	198	196.9	23.7	258	256.6	27.0
19	18.9	02.0	79	78.6	08.3	139	138.2	14.5	199	197.9	20.8	259	257.6	27.1
20	19.9	02.1	80	79.6	08.4	140	139.2	14.6	200	198.9	20.9	260	258.6	27.2
21	20.9	02.2	81	80.6	08.5	141	140.2	14.7	201	199.9	21.0	261	259.6	27.3
22	21.9	02.3	82	81.6	08·6	142	141.2	14.8	202	200.9	21.1	262	260.6	27.4
23	22.9	02.4	83	82.5	08.7	143	142.2	14.9	203	201.9	21.2	263	261.6	27.5
24	23.9	02.5	84	83.5	08.8	144	143.2	15.1	204	202.9	21.3	264	262.6	27.6
25	24.9	02.6	85	84.5	08.9	145	144.2	15.2	205	203.9	21.4	265	263.5	27.7
26	25.9	02.7	86	85.5	09.0	146	145.2	15.3	206	204.9	21.5	266	264.5	27.8
27	26.9	02.8	87	86.5	09.1	147	146.2	15.4	207	205.9	21.6	267	265.5	27.9
28	27.8	02.9	88	87.5	09.2	148	147.2	15.5	208	206.9	21.7	268	266.5	28.0
29	28.8	03.0	89	88.5	09.3	149	148.2	15.6	209	207.9	21.8	269	267.5	28.1
30	29.8	03.1	90	89.5	09.4	150	149.2	15.7	210	208.8	22.0	270	268.5	28.2
31	30.8	03.2	91	90.5	09.5	151	150.2	15.8	211	209.8	22.1	271	269.5	28.3
32	31.8	03.3	92	91.5	09.6	152	151.2	15.9	212	210.8	22.2	272	270.5	28.4
33	32.8	03.4	93	92.5	09.7	153	152.2	16.0	213	211.8	22.3	273	271.5	28.5
34	33.8	03.6	94	93.5	09.8	154	153.2	16.1	214	212.8	22.4	274	272.5	28.6
35	34.8	03.7	95	94.5	09.9	155	154.2	16.2	215	213.8	22.5	275	273.5	28.7
36	35.8	03.8	96	95.5	10.0	156	155.1	16.3	216	214.8	22.6	276	274.5	28.8
37	36.8	03.9	97	96.5	10.1	157	156.1	16.4	217	215.8	22.7	277	275.5	29.0
38	37.8	04.0	98	97.5	10.2	158	157.1	16.5	218	216.8	22.8	278	276.5	29.1
39	38.8	04.1	99	98.5	10.3	159	158.1	16.6	219	217.8	22.9	279	277.5	29.2
40	39.8	04.2	100	99.5	10.5	160	159.1	16.7	220	218.8	23.0	280	278.5	29.3
41	40.8	04.3	101	100.4	10.6	161	160.1	16.8	221	219.8	23.1	281	279.5	29.4
42	41.8	04.4	102	101.4	10.7	162	161.1	16.9	222	220.8	23.2	282	280.5	29.5
43	42.8	04.5	103	102.4	10.8	163	162.1	17.0	223	221.8	23.3	283	281.4	29.6
44	43.8	04.6	104	103.4	10.9	164	163.1	17.1	224	222.8	23.4	284	282.4	29.7
45	44.8	04.7	105	104.4	11.0	165	164.1	17.2	225	223.8	23.5	285	283.4	29.8
46	45.7	04.8	106	105.4	11.1	166	165.1	17.4	226	224.8	23.6	286	284.4	29.9
47	46.7	04.9	107	106.4	11.2	167	166.1	17.5	227	225.8	23.7	287	285.4	30.0
48	47.7	05.0	108	107.4	11.3	168	167.1	17.6	228	226.8	23.8	288	286.4	30.1
49	48.7	05.1	109	108.4	11.4	169	168.1	17.7	229	227.7	23.9	289	287.4	30.2
50	49.7	05.2	110	109.4	11.5	170	169.1	17.8	230	228.7	24.0	290	288.4	30.3
51	50.7	05.3	111	110.4	11.6	171	170.1	17.9	231	229.7	24.1	291	289.4	30.4
52	51.7	05.4	112	111.4	11.7	172	171.1	18.0	232	230.7	24.3	292	290.4	30.5
53	52.7	05.5	113	112.4	11.8	173	172.1	18.1	233	231.7	24.4	293	291.4	30.6
54	53.7	05.6	114	113.4	11.9	174	173.0	18.2	234	232.7	24.5	294	292.4	30.7
55	54.7	05.7	115	114.4	12.0	175	174.0	18.3	235	233.7	24.6	295	293.4	30.8
56	55.7	05.9	116	115.4	12.1	176	175.0	18.4	236	234.7	24.7	296	294.4	30.9
57	56.7	06.0	117	116.4	12.2	177	176.0	18.5	237	235.7	24.8	297	295.4	31.0
58	57.7	06.1	118	117.4	12.3	178	177.0	18.6	238	236.7	24.9	298	296.4	31.1
59	58.7	06.2	119	118.3	12.4	179	178.0	18.7	239	237.7	25.0	299	297.4	31.3
60	59.7	06.3	120	119.3	12.5	180	179.0	18.8	240	238.7	25.1	300	298.4	31.4
Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.

For 84 Degrees.

TABLE II.

Difference of Latitude and Departure for 7 Degrees.

Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat·	Dep.	Dist	Lat.	Dep.
1	01.0	00.1	61	60.5	07.4	121	120.1	14.7	181	179.7	22.1	241	239.2	29.4
2	02.0	00.2	62	61.5	07.6	122	121.1	14.9	182	180.6	22.2	242	240.2	29.5
3	03.0	00.4	63	62.5	07.7	123	122.1	15.0	183	181.6	22.3	243	241.2	29.6
4	04.0	00.5	64	63.5	07.8	124	123.1	15.1	184	182·6	22.4	244	242.2	29.7
5	05.0	00.6	65	64.5	07.9	125	124.1	15.2	185	183.6	22.5	245	243.2	29.9
6	06.0	00.7	66	65.5	08.0	126	125.1	15.4	186	184.6	22.7	246	244.2	30.0
7	06.9	00.9	67	66.5	08.2	127	126.1	15.5	187	185.6	22.8	247	245.2	30.1
8	07.9	01.0	68	67.5	08.3	128	127.0	15.6	188	186.6	22.9	248	246.2	30.2
9	08.9	01.1	69	68.5	08.4	129	128.0	15.7	189	187.6	23.0	249	247.1	30.3
10	09.9	01.2	70	69.5	08.5	130	129.0	15.8	190	188.6	23.2	250	248.1	30.5
11	10.9	01.3	71	70.5	08.7	131	130.0	16.0	191	189.6	23.3	251	249.1	30.6
12	11.9	01.5	72	71.5	08.8	132	131.0	16.1	192	190.6	23.4	252	250.1	30.7
13	12.9	01.6	73	72.5	08.9	133	132.0	16.2	193	191.6	23.5	253	251.1	30.8
14	13.9	01.7	74	73.4	09.0	134	133.0	16.3	194	192.6	23.6	254	252.1	31.0
15	14.9	01.8	75	74.4	09.1	135	134.0	16.5	195	193.5	23.8	255	253.1	31.1
16	15.9	01.9	76	75.4	09.3	136	135.0	16.6	196	194.5	23.9	256	254.1	31.2
17	16.9	02.1	77	76.4	09.4	137	136.0	16.7	197	195.5	24.0	257	255.1	31.3
18	17.9	02.2	78	77.4	09.5	138	137.0	16.8	198	196.5	24.1	258	256.1	31.4
19	18.9	02.3	79	78.4	09.6	139	138.0	16.9	199	197.5	24.3	259	257.1	31.6
20	19.9	02.4	80	79.4	09.7	140	139.0	17.1	200	198.5	24.4	260	258.1	31.7
21	20.8	02.6	81	80.4	09.9	141	139.9	17.2	201	199.5	24.5	261	259.1	31.8
22	21.8	02.7	82	81.4	10.0	142	140.9	17.3	202	200.5	24.6	262	260.0	31.9
23	22.8	02.8	83	82.4	10.1	143	141.9	17.4	203	201.5	24.7	263	261.0	32.1
24	23.8	02.9	84	83.4	10.2	144	142.9	17.5	204	202.5	24.9	264	262.0	32.2
25	24.8	03.0	85	84.4	10.4	145	143.9	17.7	205	203.5	25.0	265	263.0	32.3
26	25.8	03.2	86	85.4	10.5	146	144.9	17.8	206	204.5	25.1	266	264.0	32.4
27	26.8	03.3	87	86.4	10.6	147	145.9	17.9	207	205.5	25.2	267	265.0	32.5
28	27.8	03.4	88	87.3	10.7	148	146.9	18.0	208	206.4	25.3	268	266.0	32.7
29	28.8	03.5	89	88.3	10.8	149	147.9	18.2	209	207.4	25.5	269	267.0	32.8
30	29.8	03.7	90	89.3	11.0	150	148.9	18.3	210	208.4	25.6	270	268.0	32.9
31	30.8	03.8	91	90.3	11.1	151	149.9	18.4	211	209.4	25.7	271	269.0	33.0
32	31.8	03.9	92	91.3	11.2	152	150.9	18.5	212	210.4	25.8	272	270.0	33.1
33	32.8	04.0	93	92.3	11.3	153	151.9	18.6	213	211.4	26.0	273	271.0	33.3
34	33.7	04.1	94	93.3	11.5	154	152.9	18.8	214	212.4	26.1	274	272.0	33.4
35	34.7	04.3	95	94.3	11.6	155	153.8	18.9	215	213.4	26.2	275	273.0	33.5
36	35.7	04.4	96	95.3	11.7	156	154.8	19.0	216	214.4	26.3	276	273.9	33.6
37	36.7	04.5	97	96.3	11.8	157	155.8	19.1	217	215.4	26.4	277	274.9	33.8
38	37.7	04.6	98	97.3	11.9	158	156.8	19.3	218	216.4	26.6	278	275.9	33.9
39	38.7	04.8	99	98.3	12.1	159	157.8	19.4	219	217.4	26.7	279	276.9	34.0
40	39.7	04.9	100	99.3	12.2	160	158.8	19.5	220	218.4	26.8	280	277.9	34.1
41	40.7	05.0	101	100.2	12.3	161	159.8	19.6	221	219.4	26.9	281	278.9	34.2
42	41.7	05.1	102	101.2	12.4	162	160.8	19.7	222	220.3	27.1	282	279.9	34.4
43	42.7	05.2	103	102.2	12.6	163	161.8	19.9	223	221.3	27.2	283	280.9	34.5
44	43.7	05.4	104	103.2	12.7	164	162.8	20.0	224	222.3	27.3	284	281.9	34.6
45	44.7	05.5	105	104.2	12.8	165	163.8	20.1	225	223.3	27.4	285	282.9	34.7
46	45.7	05.6	106	105.2	12.9	166	164.8	20.2	226	224.3	27.5	286	283.9	34.9
47	46.6	05.7	107	106.2	13.0	167	165.8	20.4	227	225.3	27.7	287	284.9	35.0
48	47.6	05.8	108	107.2	13.2	168	166.7	20.5	228	226.3	27.8	288	285.9	35.1
49	48.6	06.0	109	108.2	13.3	169	167.7	20.6	229	227.3	27.9	289	286.8	35.2
50	49.6	06.1	110	109.2	13.4	170	168.7	20.7	230	228.3	28.0	290	287.8	35.3
51	50.6	06.2	111	110.2	13.5	171	169.7	20.8	231	229.3	28.2	291	288.8	35.5
52	51.6	06.3	112	111.2	13.6	172	170.7	21.0	232	230.3	28.3	292	289.8	35.6
53	52.6	06.5	113	112.2	13.8	173	171.7	21.1	233	231.3	28.4	293	290.8	35.7
54	53.6	06.6	114	113.2	13.9	174	172.7	21.2	234	232.3	28.5	294	291.8	35.8
55	54.6	06.7	115	114.1	14.0	175	173.7	21.3	235	233.2	28.6	295	292.8	36.0
56	55.6	06.8	116	115.1	14.1	176	174.7	21.4	236	234.2	28.8	296	293.8	36.1
57	56.6	06.9	117	116.1	14.3	177	175.7	21.6	237	235.2	28.9	297	294.8	36.2
58	57.6	07.1	118	117.1	14.4	178	176.7	21.7	238	236.2	29.0	298	295.8	36.3
59	58.6	07.2	119	118.1	14.5	179	177.7	21.8	239	237.2	29.1	299	296.8	36.4
60	59.6	07.3	120	119.1	14.6	180	178.7	21.9	240	238.2	29.2	300	297.8	36.6
Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.

For 83 Degrees.

TABLE II.

Difference of Latitude and Departure for 8 Degrees.

Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat	Dep.	Dist	Lat.	Dep.
1	01.0	00.1	61	60.4	08.5	121	119.8	16.8	181	179.2	25.2	241	238.7	33.5
2	02.0	00.3	62	61.4	08.6	122	120.8	17.0	182	180.2	25.3	242	239.6	33.7
3	03.0	00.4	63	62.4	08.8	123	121.8	17.1	183	181.2	25.5	243	240.6	33.8
4	04.0	00.6	64	63.4	08.9	124	122.8	17.3	184	182.2	25.6	244	241.6	34.0
5	05.0	00.7	65	64.4	09.0	125	123.8	17.4	185	183.2	25.7	245	242.6	34.1
6	05.9	00.8	66	65.4	09.2	126	124.8	17.5	186	184.2	25.9	246	243.6	34.2
7	06.9	01.0	67	66.3	09.3	127	125.8	17.7	187	185.2	26.0	247	244.6	34.4
8	07.9	01.1	68	67.3	09.5	128	126.8	17.8	188	186.2	26.2	248	245.6	34.5
9	08.9	01.3	69	68.3	09.6	129	127.7	18.0	189	187.2	26.3	249	246.6	34.7
10	09.9	01.4	70	69.3	09.7	130	128.7	18.1	190	188.2	26.4	250	247.6	34.8
11	10.9	01.5	71	70.3	09.9	131	129.7	18.2	191	189.1	26.6	251	248.6	34.9
12	11.9	01.7	72	71.3	10.0	132	130.7	18.4	192	190.1	26.7	252	249.5	35.1
13	12.9	01.8	73	72.3	10.2	133	131.7	18.5	193	191.1	26.9	253	250.5	35.2
14	13.9	01.9	74	73.3	10.3	134	132.7	18.6	194	192.1	27.0	254	251.5	35.3
15	14.8	02.1	75	74.3	10.4	135	133.7	18.8	195	193.1	27.1	255	252.5	35.5
16	15.8	02.2	76	75.3	10.6	136	134.7	18.9	196	194.1	27.3	256	253.5	35.6
17	16.8	02.4	77	76.3	10.7	137	135.7	19.1	197	195.1	27.4	257	254·5	35.8
18	17.8	02.5	78	77.2	10.9	138	136.7	19.2	198	196.1	27.6	258	255.5	35.9
19	18.8	02.6	79	78.2	11.0	139	137.7	19.3	199	197.1	27.7	259	256.5	36.0
20	19.8	02.8	80	79.2	11.1	140	138.6	19.5	200	198.1	27.8	260	257.5	36.2
21	20.8	02.9	81	80.2	11.3	141	139.6	19.6	201	199.0	28.0	261	258.5	36.3
22	21.8	03.1	82	81.2	11.4	142	140.6	19.8	202	200.0	28.1	262	259.5	36.5
23	22.8	03.2	83	82.2	11.6	143	141.6	19.9	203	201.0	28.3	263	260.4	36.6
24	23.8	03.3	84	83.2	11.7	144	142.6	20.0	204	202.0	28.4	264	261.4	36.7
25	24.8	03.5	85	84.2	11.8	145	143.6	20.2	205	203.0	28.5	265	262.4	36.9
26	25.7	03.6	86	85.2	12.0	146	144.6	20.3	206	204.0	28.7	266	263.4	37.0
27	26.7	03.8	87	86.2	12.1	147	145.6	20.5	207	205.0	28.8	267	264.4	37.2
28	27.7	03.9	88	87.1	12.2	148	146.6	20.6	208	206.0	28.9	268	265.4	37.3
29	28.7	04.0	89	88.1	12.4	149	147.5	20.7	209	207.0	29.1	269	266.4	37.4
30	29.7	04.2	90	89.1	12.5	150	148.5	20.9	210	208.0	29.2	270	267.4	37.6
31	30.7	04.3	91	90.1	12.7	151	149.5	21.0	211	208.9	29.4	271	268.4	37.7
32	31.7	04.5	92	91.1	12.8	152	150.5	21.2	212	209.9	29.5	272	269.4	37.9
33	32.7	04.6	93	92.1	12.9	153	151.5	21.3	213	210.9	29.6	273	270.3	38.0
34	33.7	04.7	94	93.1	13.1	154	152.5	21.4	214	211.9	29.8	274	271.3	38.1
35	34.7	04.9	95	94.1	13.2	155	153.5	21.6	215	212.9	29.9	275	272.3	38.3
36	35.6	05.0	96	95.1	13.4	156	154.5	21.7	216	213.9	30.1	276	273.3	38.4
37	36.6	05.1	97	96.1	13.5	157	155.5	21.9	217	214.9	30.2	277	274.3	38.6
38	37.6	05.3	98	97.0	13.6	158	156.5	22.0	218	215.9	30.3	278	275.3	38.7
39	38.6	05.4	99	98.0	13.8	159	157.5	22.1	219	216.9	30.5	279	276.3	38.8
40	39.6	05.6	100	99.0	13.9	160	158.4	22.3	220	217.9	30.6	280	277.3	39.0
41	40.6	05.7	101	100.0	14.1	161	159.4	22.4	221	218.8	30.8	281	278.3	39.1
42	41.6	05.8	102	101.0	14.2	162	160.4	22.5	222	219.8	30.9	282	279.3	39.2
43	42.6	06.0	103	102.0	14.3	163	161.4	22.7	223	220.8	31.0	283	280.2	39.4
44	43.6	06.1	104	103.0	14.5	164	162.4	22.8	224	221.8	31.2	284	281.2	39.5
45	44.6	06.3	105	104.0	14.6	165	163.4	23.0	225	222.8	31.3	285	282.2	39.7
46	45.6	06.4	106	105.0	14.8	166	164.4	23.1	226	223.8	31.5	286	283.2	39.8
47	46.5	06.5	107	106.0	14.9	167	165.4	23.2	227	224.8	31.6	287	284.2	39.9
48	47.5	06.7	108	106.9	15.0	168	166.4	23.4	228	225.8	31.7	288	285.2	40.1
49	48.5	06.8	109	107.9	15.2	169	167.4	23.5	229	226.8	31.9	289	286.2	40.2
50	49.5	07.0	110	108.9	15.3	170	168.3	23.7	230	227.8	32.0	290	287.2	40.4
51	50.5	07.1	111	109.9	15.4	171	169.3	23.8	231	228.8	32.1	291	288.2	40.5
52	51.5	07.2	112	110.9	15.6	172	170.3	23.9	232	229.7	32.3	292	289.2	40.6
53	52.5	07.4	113	111.9	15.7	173	171.3	24.1	233	230.7	32.4	293	290.1	40.8
54	53.5	07.5	114	112.9	15.9	174	172.3	24.2	234	231.7	32.6	294	291.1	40.9
55	54.5	07.7	115	113.9	16.0	175	173.3	24.4	235	232.7	32.7	295	292.1	41.1
56	55.5	07.8	116	114.9	16.1	176	174.3	24.5	236	233.7	32.8	296	293.1	41.2
57	56.4	07.9	117	115.9	16.3	177	175.3	24.6	237	234.7	33.0	297	294.1	41.3
58	57.4	08.1	118	116.9	16.4	178	176.3	24.8	238	235.7	33.1	298	295.1	41.5
59	58.4	08.2	119	117.8	16.6	179	177.3	24.9	239	236.7	33.3	299	296.1	41.6
60	59.4	08.4	120	118.8	16.7	180	178.2	25.1	240	237.7	33.4	300	297.1	41.8
Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.

For 82 Degrees.

TABLE II.

Difference of Latitude and Departure for 9 Degrees.

Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.
1	01.0	00.2	61	60.2	09.5	121	119.5	18.9	181	178.8	28.3	241	238.0	37.7
2	02.0	00.3	62	61.2	09.7	122	120.5	19.1	182	179.8	28.5	242	239.0	37.9
3	03.0	00.5	63	62.2	09.9	123	121.5	19.2	183	180.7	28.6	243	240.0	38.0
4	04.0	00.6	64	63.2	10.0	124	122.5	19.4	184	181.7	28.8	244	241.0	38.2
5	04.9	00.8	65	64.2	10.2	125	123.5	19.6	185	182.7	28.9	245	242.0	38.3
6	05.9	00.9	66	65.2	10.3	126	124.4	19.7	186	183.7	29.1	246	243.0	38.5
7	06.9	01.1	67	66.2	10.5	127	125.4	19.9	187	184.7	29.3	247	244.0	38.6
8	07.9	01.3	68	67.2	10.6	128	126.4	20.0	188	185.7	29.4	248	244.9	38.8
9	08.9	01.4	69	68.2	10.8	129	127.4	20.2	189	186.7	29.6	249	245.9	39.0
10	09.9	01.6	70	69.1	11.0	130	128.4	20.3	190	187.7	29.7	250	246.9	39.1
11	10.9	01.7	71	70.1	11.1	131	129.4	20.5	191	188.6	29.9	251	247.9	39.3
12	11.9	01.9	72	71.1	11.3	132	130.4	20.6	192	189.6	30.0	252	248.9	39.4
13	12.8	02.0	73	72.1	11.4	133	131.4	20.8	193	190.6	30.2	253	249.9	39.6
14	13.8	02.2	74	73.1	11.6	134	132.4	21.0	194	191.6	30.3	254	250.9	39.7
15	14.8	02.3	75	74.1	11.7	135	133.3	21.1	195	192.6	30.5	255	251.9	39.9
16	15.8	02.5	76	75.1	11.9	136	134.3	21.3	196	193.6	30.7	256	252.8	40.0
17	16.8	02.7	77	76.1	12.0	137	135.3	21.4	197	194.6	30.8	257	253.8	40.2
18	17.8	02.8	78	77.0	12.2	138	136.3	21.6	198	195.6	31.0	258	254.8	40.4
19	18.8	03.0	79	78.0	12.4	139	137.3	21.7	199	196.5	31.1	259	255.8	40.5
20	19.8	03.1	80	79.0	12.5	140	138.3	21.9	200	197.5	31.3	260	256.8	40.7
21	20.7	03.3	81	80.0	12.7	141	139.3	22.1	201	198.5	31.4	261	257.8	40.8
22	21.7	03.4	82	81.0	12.8	142	140.3	22.2	202	199.5	31.6	262	258.8	41.0
23	22.7	03.6	83	82.0	13.0	143	141.2	22.4	203	200.5	31.8	263	259.8	41.1
24	23.7	03.8	84	83.0	13.1	144	142.2	22.5	204	201.5	31.9	264	260.7	41.3
25	24.7	03.9	85	84.0	13.3	145	143.2	22.7	205	202.5	32.1	265	261.7	41.5
26	25.7	04.1	86	84.9	13.5	146	144.2	22.8	206	203.5	32.2	266	262.7	41.6
27	26.7	04.2	87	85.9	13.6	147	145.2	23.0	207	204.5	32.4	267	263.7	41.8
28	27.7	04.4	88	86.9	13.8	148	146.2	23.2	208	205.4	32.5	268	264.7	41.9
29	28.6	04.5	89	87.9	13.9	149	147.2	23.3	209	206.4	32.7	269	265.7	42.1
30	29.6	04.7	90	88.9	14.1	150	148.2	23.5	210	207.4	32.9	270	266.7	42.2
31	30.6	04.8	91	89.9	14.2	151	149.1	23.6	211	208.4	33.0	271	267.7	42.4
32	31.6	05.0	92	90.9	14.4	152	150.1	23.8	212	209.4	33.2	272	268.7	42.6
33	32.6	05.2	93	91.9	14.5	153	151.1	23.9	213	210.4	33.3	273	269.6	42.7
34	33.6	05.3	94	92.8	14.7	154	152.1	24.1	214	211.4	33.5	274	270.6	42.9
35	34.6	05.5	95	93.8	14.9	155	153.1	24.2	215	212.4	33.6	275	271.6	43.0
36	35.6	05.6	96	94.8	15.0	156	154.1	24.4	216	213.3	33.8	276	272.6	43.2
37	36.5	05.8	97	95.8	15.2	157	155.1	24.6	217	214.3	33.9	277	273.6	43.3
38	37.5	05.9	98	96.8	15.3	158	156.1	24.7	218	215.3	34.1	278	274.6	43.5
39	38.5	06.1	99	97.8	15.5	159	157.0	24.9	219	216.3	34.3	279	275.6	43.6
40	39.5	06.3	100	98.8	15.6	160	158.0	25.0	220	217.3	34.4	280	276.6	43.8
41	40.5	06.4	101	99.8	15.8	161	159.0	25.2	221	218.3	34.6	281	277.5	44.0
42	41.5	06.6	102	100.7	16.0	162	160.0	25.3	222	219.3	34.7	282	278.5	44.1
43	42.5	06.7	103	101.7	16.1	163	161.0	25.5	223	220.3	34.9	283	279.5	44.3
44	43.5	06.9	104	102.7	16.3	164	162.0	25.7	224	221.2	35.0	284	280.5	44.4
45	44.4	07.0	105	103.7	16.4	165	163.0	25.8	225	222.2	35.2	285	281.5	44.6
46	45.4	07.2	106	104.7	16.6	166	164.0	26.0	226	223.2	35.4	286	282.5	44.7
47	46.4	07.4	107	105.7	16.7	167	164.9	26.1	227	224.2	35.5	287	283.5	44.9
48	47.4	07.5	108	106.7	16.9	168	165.9	26.3	228	225.2	35.7	288	284.5	45.1
49	48.4	07.7	109	107.7	17.1	169	166.9	26.4	229	226.2	35.8	289	285.4	45.2
50	49.4	07.8	110	108.6	17.2	170	167.9	26.6	230	227.2	36.0	290	286.4	45.4
51	50.4	08.0	111	109.6	17.4	171	168.9	26.8	231	228.2	36.1	291	287.4	45.5
52	51.4	08.1	112	110.6	17.5	172	169.9	26.9	232	229.1	36.3	292	288.4	45.7
53	52.3	08.3	113	111.6	17.7	173	170.9	27.1	233	230.1	36.4	293	289.4	45.8
54	53.3	08.4	114	112.6	17.8	174	171.9	27.2	234	231.1	36.6	294	290.4	46.0
55	54.3	08.6	115	113.6	18.0	175	172.8	27.4	235	232.1	36.8	295	291.4	46.1
56	55.3	08.8	116	114.6	18.1	176	173.8	27.5	236	233.1	36.9	296	292.4	46.3
57	56.3	08.9	117	115.6	18.3	177	174.8	27.7	237	234.1	37.1	297	293.3	46.5
58	57.3	09.1	118	116.5	18.5	178	175.8	27.8	238	235.1	37.2	298	294.3	46.6
59	58.3	09.2	119	117.5	18.6	179	176.8	28.0	239	236.1	37.4	299	295.3	46.8
60	59.3	09.4	120	118.5	18.8	180	177.8	28.2	240	237.0	37.5	300	296.3	46.9
Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.

D

For 82 Degrees.

TABLE II.

Difference of Latitude and Departure for 10 Degrees.

Dist	Lat.	Dep.	Dist	Lat.	Dep	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.
1	01.0	00.2	61	60.1	10.6	121	119.2	21.0	181	178.3	31.4	241	237.3	41.8
2	02.0	00.3	62	61.1	10.8	122	120.1	21.2	182	179.2	31.6	242	238.3	42.0
3	03.0	00.5	63	62.0	10.9	123	121.1	21.4	183	180.2	31.8	243	239.3	42.2
4	03.9	00.7	64	63.0	11.1	124	122.1	21.5	184	181.2	32.0	244	240.3	42.4
5	04.9	00.9	65	64.0	11.3	125	123.1	21.7	185	182.2	32.1	245	241.3	42.5
6	05.9	01.0	66	65.0	11.5	126	124.1	21.9	186	183.2	32.3	246	242.3	42.7
7	06.9	01.2	67	66.0	11.6	127	125.1	22.1	187	184.2	32.5	247	243.2	42.9
8	07.9	01.4	68	67.0	11.8	128	126.1	22.2	188	185.1	32.6	248	244.2	43.1
9	08.9	01.6	69	68.0	12.0	129	127.0	22.4	189	186.1	32.8	249	245.2	43.2
10	09.8	01.7	70	68.9	12.2	130	128.0	22.6	190	187.1	33.0	250	246.2	43.4
11	10.8	01.9	71	69.9	12.3	131	129.0	22.7	191	188.1	33.2	251	247.2	43.6
12	11.8	02.1	72	70.9	12.5	132	130.0	22.9	192	189.1	33.3	252	248.2	43.8
13	12.8	02.3	73	71.9	12.7	133	131.0	23.1	193	190.1	33.5	253	249.2	43.9
14	13.8	02.4	74	72.9	12.8	134	132.0	23.3	194	191.1	33.7	254	250.1	44.1
15	14.8	02.6	75	73.9	13.0	135	132.9	23.4	195	192.0	33.9	255	251.1	44.3
16	15.8	02.8	76	74.8	13.2	136	133.9	23.6	196	193.0	34.0	256	252.1	44.5
17	16.7	03.0	77	75.8	13.4	137	134.9	23.8	197	194.0	34.2	257	253.1	44.6
18	17.7	03.1	78	76.8	13.5	138	135.9	24.0	198	195.0	34.4	258	254.1	44.8
19	18.7	03.3	79	77.8	13.7	139	136.9	24.1	199	196.0	34.6	259	255.1	45.0
20	19.7	03.5	80	78.8	13.9	140	137.9	24.3	200	197.0	34.7	260	256.1	45.1
21	20.7	03.6	81	79.8	14.1	141	138.9	24.5	201	197.9	34.9	261	257.0	45.3
22	21.7	03.8	82	80.8	14.2	142	139.8	24.7	202	198.9	35.1	262	258.0	45.5
23	22.7	04.0	83	81.7	14.4	143	140.8	24.8	203	199.9	35.3	263	259.0	45.7
24	23.6	04.2	84	82.7	14.6	144	141.8	25.0	204	200.9	35.4	264	260.0	45.8
25	24.6	04.3	85	83.7	14.8	145	142.8	25.2	205	201.9	35.6	265	261.0	46.0
26	25.6	04.5	86	84.7	14.9	146	143.8	25.4	206	202.9	35.8	266	262.0	46.2
27	26.6	04.7	87	85.7	15.1	147	144.8	25.5	207	203.9	35.9	267	262.9	46.4
28	27.6	04.9	88	86.7	15.3	148	145.8	25.7	208	204.8	36.1	268	263.9	46.5
29	28.6	05.0	89	87.6	15.5	149	146.7	25.9	209	205.8	36.3	269	264.9	46.7
30	29.5	05.2	90	88.6	15.6	150	147.7	26.0	210	206.8	36.5	270	265.9	46.9
31	30.5	05.4	91	89.6	15.8	151	148.7	26.2	211	207.8	36.6	271	266.9	47.1
32	31.5	05.6	92	90.6	16.0	152	149.7	26.4	212	208.8	36.8	272	267.9	47.2
33	32.5	05.7	93	91.6	16.1	153	150.7	26.6	213	209.8	37.0	273	268.9	47.4
34	33.5	05.9	94	92.6	16.3	154	151.7	26.7	214	210.7	37.2	274	269.8	47.6
35	34.5	06.1	95	93.6	16.5	155	152.6	26.9	215	211.7	37.3	275	270.8	47.8
36	35.5	06.3	96	94.5	16.7	156	153.6	27.1	216	212.7	37.5	276	271.8	47.9
37	36.4	06.4	97	95.5	16.8	157	154.6	27.3	217	213.7	37.7	277	272.8	48.1
38	37.4	06.6	98	96.5	17.0	158	155.6	27.4	218	214.7	37.9	278	273.8	48.3
39	38.4	06.8	99	97.5	17.2	159	156.6	27.6	219	215.7	38.0	279	274.8	48.4
40	39.4	06.9	100	98.5	17.4	160	157.6	27.8	220	216.7	38.2	280	275.7	48.6
41	40.4	07.1	101	99.5	17.5	161	158.6	28.0	221	217.6	38.4	281	276.7	48.8
42	41.4	07.3	102	100.5	17.7	162	159.5	28.1	222	218.6	38.5	282	277.7	49.0
43	42.3	07.5	103	101.4	17.9	163	160.5	28.3	223	219.6	38.7	283	278.7	49.1
44	43.3	07.6	104	102.4	18.1	164	161.5	28.5	224	220.6	38.9	284	279.7	49.3
45	44.3	07.8	105	103.4	18.2	165	162.5	28.7	225	221.6	39.1	285	280.7	49.5
46	45.3	08.0	106	104.4	18.4	166	163.5	28.8	226	222.6	39.2	286	281.7	49.7
47	46.3	08.2	107	105.4	18.6	167	164.5	29.0	227	223.6	39.4	287	282.6	49.8
48	47.3	08.3	108	106.4	18.8	168	165.4	29.2	228	224.5	39.6	288	283.6	50.0
49	48.3	08.5	109	107.3	18.9	169	166.4	29.3	229	225.5	39.8	289	284.6	50.2
50	49.2	08.7	110	108.3	19.1	170	167.4	29.5	230	226.5	39.9	290	285.6	50.4
51	50.2	08.9	111	109.3	19.3	171	168.4	29.7	231	227.5	40.1	291	286.6	50.5
52	51.2	09.0	112	110.3	19.4	172	169.4	29.9	232	228.5	40.3	292	287.6	50.7
53	52.2	09.2	113	111.3	19.6	173	170.4	30.0	233	229.5	40.5	293	288.5	50.9
54	53.2	09.4	114	112.3	19.8	174	171.4	30.2	234	230.4	40.6	294	289.5	51.1
55	54.2	09.6	115	113.3	20.0	175	172.3	30.4	235	231.4	40.8	295	290.5	51.2
56	55.1	09.7	116	114.2	20.1	176	173.3	30.6	236	232.4	41.0	296	291.5	51.4
57	56.1	09.9	117	115.2	20.3	177	174.3	30.7	237	233.4	41.2	297	292.5	51.6
58	57.1	10.1	118	116.2	20.5	178	175.3	30.9	238	234.4	41.3	298	293.5	51.7
59	58.1	10.2	119	117.2	20.7	179	176.3	31.1	239	235.4	41.5	299	294.5	51.9
60	59.1	10.4	120	118.2	20.8	180	177.3	31.3	240	236.4	41.7	300	295.4	52.1
Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.

For 80 Degrees.

TABLE II.

Difference of Latitude and Departure for 11 Degrees.

Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.
1	01.0	00.2	61	59.9	11.6	121	118.8	23.1	181	177.7	34.5	241	236.6	46.0
2	02.0	00.4	62	60.9	11.8	122	119.8	23.3	182	178.7	34.7	242	237.6	46.2
3	02.9	00.6	63	61.8	12.0	123	120.7	23.5	183	179.6	34.9	243	238.5	46.4
4	03.9	00.8	64	62.8	12.2	124	121.7	23.7	184	180.6	35.1	244	239.5	46.6
5	04.9	01.0	65	63.8	12.4	125	122.7	23.9	185	181.6	35.3	245	240.5	46.7
6	05.9	01.1	66	64.8	12.6	126	123.7	24.0	186	182.6	35.5	246	241.5	46.9
7	06.9	01.3	67	65.8	12.8	127	124.7	24.2	187	183.6	35.7	247	242.5	47.1
8	07.9	01.5	68	66.8	13.0	128	125.6	24.4	188	184.5	35.9	248	243.4	47.3
9	08.8	01.7	69	67.7	13.2	129	126.6	24.6	189	185.5	36.1	249	244.4	47.5
10	09.8	01.9	70	68.7	13.4	130	127.6	24.8	190	186.5	36.3	250	245.4	47.7
11	10.8	02.1	71	69.7	13.5	131	128.6	25.0	191	187.5	36.4	251	246.4	47.9
12	11.8	02.3	72	70.7	13.7	132	129.6	25.2	192	188.5	36.6	252	247.4	48.1
13	12.8	02.5	73	71.7	13.9	133	130.6	25.4	193	189.5	36.8	253	248.4	48.3
14	13.7	02.7	74	72.6	14.1	134	131.5	25.6	194	190.4	37.0	254	249.3	48.5
15	14.7	02.9	75	73.6	14.3	135	132.5	25.8	195	191.4	37.2	255	250.3	48.7
16	15.7	03.1	76	74.6	14.5	136	133.5	26.0	196	192.4	37.4	256	251.3	48.8
17	16.7	03.2	77	75.6	14.7	137	134.5	26.1	197	193.4	37.6	257	252.3	49.0
18	17.7	03.4	78	76.6	14.9	138	135.5	26.3	198	194.4	37.8	258	253.3	49.2
19	18.7	03.6	79	77.5	15.1	139	136.4	26.5	199	195.3	38.0	259	254.2	49.4
20	19.6	03.8	80	78.5	15.3	140	137.4	26.7	200	196.3	38.2	260	255.2	49.6
21	20.6	04.0	81	79.5	15.5	141	138.4	26.9	201	197.3	38.4	261	256.2	49.8
22	21.6	04.2	82	80.5	15.6	142	139.4	27.1	202	198.3	38.5	262	257.2	50.0
23	22.6	04.4	83	81.5	15.8	143	140.4	27.3	203	199.3	38.7	263	258.2	50.2
24	23.6	04.6	84	82.5	16.0	144	141.4	27.5	204	200.3	38.9	264	259.1	50.4
25	24.5	04.8	85	83.4	16.2	145	142.3	27.7	205	201.2	39.1	265	260.1	50.6
26	25.5	05.0	86	84.4	16.4	146	143.3	27.9	206	202.2	39.3	266	261.1	50.8
27	26.5	05.2	87	85.4	16.6	147	144.3	28.0	207	203.2	39.5	267	262.1	50.9
28	27.5	05.3	88	86.4	16.8	148	145.3	28.2	208	204.2	39.7	268	263.1	51.1
29	28.5	05.5	89	87.4	17.0	149	146.3	28.4	209	205.2	39.9	269	264.1	51.3
30	29.4	05.7	90	88.3	17.2	150	147.2	28.6	210	206.1	40.1	270	265.0	51.5
31	30.4	05.9	91	89.3	17.4	151	148.2	28.8	211	207.1	40.3	271	266.0	51.7
32	31.4	06.1	92	90.3	17.6	152	149.2	29.0	212	208.1	40.5	272	267.0	51.9
33	32.4	06.3	93	91.3	17.7	153	150.2	29.2	213	209.1	40.6	273	268.0	52.1
34	33.4	06.5	94	92.3	17.9	154	151.2	29.4	214	210.1	40.8	274	269.0	52.3
35	34.4	06.7	95	93.3	18.1	155	152.2	29.6	215	211.0	41.0	275	269.9	52.5
36	35.3	06.9	96	94.2	18.3	156	153.1	29.8	216	212.0	41.2	276	270.9	52.7
37	36.3	07.1	97	95.2	18.5	157	154.1	30.0	217	213.0	41.4	277	271.9	52.9
38	37.3	07.3	98	96.2	18.7	158	155.1	30.1	218	214.0	41.6	278	272.9	53.0
39	38.3	07.4	99	97.2	18.9	159	156.1	30.3	219	215.0	41.8	279	273.9	53.2
40	39.3	07.6	100	98.2	19.1	160	157.1	30.5	220	216.0	42.0	280	274.9	53.4
41	40.2	07.8	101	99.1	19.3	161	158.0	30.7	221	216.9	42.2	281	275.8	53.6
42	41.2	08.0	102	100.1	19.5	162	159.0	30.9	222	217.9	42.4	282	276.8	53.8
43	42.2	08.2	103	101.1	19.7	163	160.0	31.1	223	218.9	42.6	283	277.8	54.0
44	43.2	08.4	104	102.1	19.8	164	161.0	31.3	224	219.9	42.7	284	278.8	54.2
45	44.2	08.6	105	103.1	20.0	165	162.0	31.5	225	220.9	42.9	285	279.8	54.4
46	45.2	08.8	106	104.1	20.2	166	163.0	31.7	226	221.8	43.1	286	280.7	54.6
47	46.1	09.0	107	105.0	20.4	167	163.9	31.9	227	222.8	43.3	287	281.7	54.8
48	47.1	09.2	108	106.0	20.6	168	164.9	32.1	228	223.8	43.5	288	282.7	55.0
49	48.1	09.3	109	107.0	20.8	169	165.9	32.2	229	224.8	43.7	289	283.7	55.1
50	49.1	09.5	110	108.0	21.0	170	166.9	32.4	230	225.8	43.9	290	284.7	55.3
51	50.1	09.7	111	109.0	21.2	171	167.9	32.6	231	226.8	44.1	291	285.7	55.5
52	51.0	09.9	112	109.9	21.4	172	168.8	32.8	232	227.7	44.3	292	286.6	55.7
53	52.0	10.1	113	110.9	21.6	173	169.8	33.0	233	228.7	44.5	293	287.6	55.9
54	53.0	10.3	114	111.9	21.8	174	170.8	33.2	234	229.7	44.6	294	288.6	56.1
55	54.0	10.5	115	112.9	21.9	175	171.8	33.4	235	230.7	44.8	295	289.6	56.3
56	55.0	10.7	116	113.9	22.1	176	172.8	33.6	236	231.7	45.0	296	290.6	56.5
57	56.0	10.9	117	114.9	22.3	177	173.7	33.8	237	232.6	45.2	297	291.5	56.7
58	56.9	11.1	118	115.8	22.5	178	174.7	34.0	238	233.6	45.4	298	292.5	56.9
59	57.9	11.3	119	116.8	22.7	179	175.7	34.2	239	234.6	45.6	299	293.5	57.1
60	58.9	11.4	120	117.8	22.9	180	176.7	34.3	240	235.6	45.8	300	294.5	57.3
Dist	Dep	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.

For 79 Degrees.

TABLE II.

Difference of Latitude and Departure for 12 Degrees.

Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.
1	01.0	00.2	61	59.7	12.7	121	118.4	25.2	181	177.0	37.6	241	235.7	50.1
2	02.0	00.4	62	60.6	12.9	122	119.3	25.4	182	178.0	37.8	242	236.7	50.3
3	02.9	00.6	63	61.6	13.1	123	120.3	25.6	183	179.0	38.0	243	237.7	50.5
4	03.9	00.8	64	82.6	13.3	124	121.3	25.8	184	180.0	38.3	244	238.7	50.7
5	04.9	01.0	65	63.6	13.5	125	122.3	26.0	185	181.0	38.5	245	239.6	50.9
6	05.9	01.2	66	64.6	13.7	126	123.2	26.2	186	181.9	38.7	246	240.6	51.1
7	06.8	01.5	67	65.5	13.9	127	124.2	26.4	187	182.9	38.9	247	241.6	51.4
8	07.8	01.7	68	66.5	14.1	128	125.2	26.6	188	183.9	39.1	248	242.6	51.6
9	08.8	01.9	69	67.5	14.3	129	126.2	26.8	189	184.9	39.3	249	243.6	51.8
10	09.8	02.1	70	68.5	14.6	130	127.2	27.0	190	185.8	39.5	250	244.5	52.0
11	10.8	02.3	71	69.4	14.8	131	128.1	27.2	191	186.8	39.7	251	245.5	52.2
12	11.7	02.5	72	70.4	15.0	132	129.1	27.4	192	187.8	39.9	252	246.5	52.4
13	12.7	02.7	73	71.4	15.2	133	130.1	27.7	193	188.8	40.1	253	247.5	52.6
14	13.7	02.9	74	72.4	15.4	134	131.1	27.9	194	189.8	40.3	254	248.4	52.8
15	14.7	03.1	75	73.4	15.6	135	132.0	28.1	195	190.7	40.5	255	249.4	53.0
16	15.7	03.3	76	74.3	15.8	136	133.0	28.3	196	191.7	40.8	256	250.4	53.2
17	16.6	03.5	77	75.3	16.0	137	134.0	28.5	197	192.7	41.0	257	251.4	53.4
18	17.6	03.7	78	76.3	16.2	138	135.0	28.7	198	193.7	41.2	258	252.4	53.6
19	18.6	04.0	79	77.3	16.4	139	136.0	28.9	199	194.7	41.4	259	253.3	53.8
20	19.6	04.2	80	78.3	16.6	140	136.9	29.1	200	195.6	41.6	260	254.3	54.1
21	20.5	04.4	81	79.2	16.8	141	137.9	29.3	201	196.6	41.8	261	255.3	54.3
22	21.5	04.6	82	80.2	17.0	142	138.9	29.5	202	197.6	42.0	262	256.3	54.5
23	22.5	04.8	83	81.2	17.3	143	139.9	29.7	203	198.6	42.2	263	257.3	54.7
24	23.5	05.0	84	82.2	17.5	144	140.9	29.9	204	199.5	42.4	264	258.2	54.9
25	24.5	05.2	85	83.1	17.7	145	141.8	30.1	205	200.5	42.6	265	259.2	55.1
26	25.4	05.4	86	84.1	17.9	146	142.8	30.4	206	201.5	42.8	266	260.2	55.3
27	26.4	05.6	87	85.1	18.1	147	143.8	30.6	207	202.5	43.0	267	261.2	55.5
28	27.4	05.8	88	86.1	18.3	148	144.8	30.8	208	203.5	43.2	268	262.1	55.7
29	28.4	06.0	89	87.1	18.5	149	145.7	31.0	209	204.4	43.5	269	263.1	55.9
30	29.3	06.2	90	88.0	18.7	150	146.7	31.2	210	205.4	43.7	270	264.1	56.1
31	30.3	06.4	91	89.0	18.9	151	147.7	31.4	211	206.4	43.9	271	265.1	56.3
32	31.3	06.7	92	90.0	19.1	152	148.7	31.6	212	207.4	44.1	272	266.1	56.6
33	32.3	06.9	93	91.0	19.3	153	149.7	31.8	213	208.3	44.3	273	267.0	56.8
34	33.3	07.1	94	91.9	19.5	154	150.6	32.0	214	209.3	44.5	274	268.0	57.0
35	34.2	07.3	95	92.9	19.8	155	151.6	32.2	215	210.3	44.7	275	269.0	57.2
36	35.2	07.5	96	93.9	20.0	156	152.6	32.4	216	211.3	44.9	276	270.0	57.4
37	36.2	07.7	97	94.9	20.2	157	153.6	32.6	217	212.3	45.1	277	270.9	57.6
38	37.2	07.9	98	95.9	20.4	158	154.5	32.9	218	213.2	45.3	278	271.9	57.8
39	38.1	08.1	99	96.8	20.6	159	155.5	33.1	219	214.2	45.5	279	272.9	58.0
40	39.1	08.3	100	97.8	20.8	160	156.5	33.3	220	215.2	45.7	280	273.9	58.2
41	40.1	08.5	101	98.8	21.0	161	157.5	33.5	221	216.2	45.9	281	274.9	58.4
42	41.1	08.7	102	99.8	21.2	162	158.5	33.7	222	217.1	46.2	282	275.8	58.6
43	42.1	08.9	103	100.7	21.4	163	159.4	33.9	223	218.1	46.4	283	276.8	58.8
44	43.0	09.1	104	101.7	21.6	164	160.4	34.1	224	219.1	46.6	284	277.8	59.0
45	44.0	09.4	105	102.7	21.8	165	161.4	34.3	225	220.1	46.8	285	278.8	59.3
46	45.0	09.6	106	103.7	22.0	166	162.4	34.5	226	221.1	47.0	286	279.8	59.5
47	46.0	09.8	107	104.7	22.2	167	163.4	34.7	227	222.0	47.2	287	280.7	59.7
48	47.0	10.0	108	105.6	22.5	168	164.3	34.9	228	223.0	47.4	288	281.7	59.9
49	47.9	10.2	109	106.6	22.7	169	165.3	35.1	229	224.0	47.6	289	282.7	60.1
50	48.9	10.4	110	107.6	22.9	170	166.3	35.3	230	225.0	47.8	290	283.7	60.3
51	49.9	10.6	111	108.6	23.1	171	167.3	35.6	231	226.0	48.0	291	284.6	60.5
52	50.9	10.8	112	109.6	23.3	172	168.2	35.8	232	226.9	48.2	292	285.6	60.7
53	51.8	11.0	113	110.5	23.5	173	169.2	36.0	233	227.9	48.4	293	286.6	60.9
54	52.8	11.2	114	111.5	23.7	174	170.2	36.2	234	228.9	48.7	294	287.6	61.1
55	53.8	11.4	115	112.5	23.9	175	171.2	36.4	235	229.9	48.9	295	288.6	61.3
56	54.8	11.6	116	113.5	24.1	176	172.2	36.6	236	230.8	49.1	296	289.5	61.5
57	55.8	11.9	117	114.4	24.3	177	173.1	36.8	237	231.8	49.3	297	290.5	61.7
58	56.7	12.1	118	115.4	24.5	178	174.1	37.0	238	232.8	49.5	298	291.5	62.0
59	57.7	12.3	119	116.4	24.7	179	175.1	37.2	239	233.8	49.7	299	292.5	62.2
60	58.7	12.5	120	117.4	24.9	180	176.1	37.4	240	234.8	49.9	300	293.4	62.4
Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.

For 78 Degrees.

TABLE II.

Difference of Latitude and Departure for 13 Degrees.

Dist	Lat.	Dep.	Dist	Lat.	Dep	Dist	Lat	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.
1	01.0	00.2	61	59.4	13.7	121	117.9	27.2	181	176.4	40.7	241	234.8	54.2
2	01.9	00.4	62	60.4	13.9	122	118.9	27.4	182	177.3	40.9	242	235.8	54.4
3	02.9	00.7	63	61.4	14.2	123	119.8	27.7	183	178.3	41.2	243	236.8	54.7
4	03.9	00.9	64	62.4	14.4	124	120.8	27.9	184	179.3	41.4	244	237.7	54.9
5	04.9	01.1	65	63.3	14.6	125	121.8	28.1	185	180.3	41.6	245	238.7	55.1
6	05.8	01.3	66	64.3	14.8	126	122.8	28.3	186	181.2	41.8	246	239.7	55.3
7	06.8	01.6	67	65.3	15.1	127	123.7	28.6	187	182.2	42.1	247	240.7	55.6
8	07.8	01.8	68	66.3	15.3	128	124.7	28.8	188	183.2	42.3	248	241.6	55.8
9	08.8	02.0	69	67.2	15.5	129	125.7	29.0	189	184.2	42.5	249	242.6	56.0
10	09.7	02.2	70	68.2	15.7	130	126.7	29.2	190	185.1	42.7	250	243.6	56.2
11	10.7	02.5	71	69.2	16.0	131	127.6	29.5	191	186.1	43.0	251	244.6	56.5
12	11.7	02.7	72	70.2	16.2	132	128.6	29.7	192	187.1	43.2	252	245.5	56.7
13	12.7	02.9	73	71.1	16.4	133	129.6	29.9	193	188.1	43.4	253	246.5	56.9
14	13.6	03.1	74	72.1	16.6	134	130.6	30.1	194	189.0	43.6	254	247.5	57.1
15	14.6	03.4	75	73.1	16.9	135	131.5	30.4	195	190.0	43.9	255	248.5	57.4
16	15.6	03.6	76	74.1	17.1	136	132.5	30.6	196	191.0	44.1	256	249.4	57.6
17	16.6	03.8	77	75.0	17.3	137	133.5	30.8	197	192.0	44.3	257	250.4	57.8
18	17.5	04.0	78	76.0	17.5	138	134.5	31.0	198	192.9	44.5	258	251.4	58.0
19	18.5	04.3	79	77.0	17.8	139	135.4	31.3	199	193.9	44.8	259	252.4	58.3
20	19.5	04.5	80	77.9	18.0	140	136.4	31.5	200	194.9	45.0	260	253.3	58.5
21	20.5	04.7	81	78.9	18.2	141	137.4	31.7	201	195.8	45.2	261	254.3	58.7
22	21.4	04.9	82	79.9	18.4	142	138.4	31.9	202	196.8	45.4	262	255.3	58.9
23	22.4	05.2	83	80.9	18.7	143	139.3	32.2	203	197.8	45.7	263	256.3	59.2
24	23.4	05.4	84	81.8	18.9	144	140.3	32.4	204	198.8	45.9	264	257.2	59.4
25	24.4	05.6	85	82.8	19.1	145	141.3	32.6	205	199.7	46.1	265	258.2	59.6
26	25.3	05.8	86	83.8	19.3	146	142.3	32.8	206	200.7	46.3	266	259.2	59.8
27	26.3	06.1	87	84.8	19.6	147	143.2	33.1	207	201.7	46.6	267	260.2	60.1
28	27.3	06.3	88	85.7	19.8	148	144.2	33.3	208	202.7	46.8	268	261.1	60.3
29	28.3	06.5	89	86.7	20.0	149	145.2	33.5	209	203.6	47.0	269	262.1	60.5
30	29.2	06.7	90	87.7	20.2	150	146.2	33.7	210	204.6	47.2	270	263.1	60.7
31	30.2	07.0	91	88.7	20.5	151	147.1	34.0	211	205.6	47.5	271	264.1	61.0
32	31.2	07.2	92	89.6	20.7	152	148.1	34.2	212	206.6	47.7	272	265.0	61.2
33	32.2	07.4	93	90.6	20.9	153	149.1	34.4	213	207.5	47.9	273	266.0	61.4
34	33.1	07.6	94	91.6	21.1	154	150.1	34.6	214	208.5	48.1	274	267.0	61.6
35	34.1	07.9	95	92.6	21.4	155	151.0	34.9	215	209.5	48.4	275	268.0	61.9
36	35.1	08.1	96	93.5	21.6	156	152.0	35.1	216	210.5	48.6	276	268.9	62.1
37	36.1	08.3	97	94.5	21.8	157	153.0	35.3	217	211.4	48.8	277	269.9	62.3
38	37.0	08.5	98	95.5	22.0	158	154.0	35.5	218	212.4	49.0	278	270.9	62.5
39	38.0	08.8	99	96.5	22.3	159	154.9	35.8	219	213.4	49.3	279	271.8	62.8
40	39.0	09.0	100	97.4	22.5	160	155.9	36.0	220	214.4	49.5	280	272.8	63.0
41	39.9	09.2	101	98.4	22.7	161	156.9	36.2	221	215.3	49.7	281	273.8	63.2
42	40.9	09.4	102	99.4	22.9	162	157.8	36.4	222	216.3	49.9	282	274.8	63.4
43	41.9	09.7	103	100.4	23.2	163	158.8	36.7	223	217.3	50.2	283	275.7	63.7
44	42.9	09.9	104	101.3	23.4	164	159.8	36.9	224	218.3	50.4	284	276.7	63.9
45	43.8	10.1	105	102.3	23.6	165	160.8	37.1	225	219.2	50.6	285	277.7	64.1
46	44.8	10.3	106	103.3	23.8	166	161.7	37.3	226	220.2	50.8	286	278.7	64.3
47	45.8	10.6	107	104.3	24.1	167	162.7	37.6	227	221.2	51.1	287	279.6	64.6
48	46.8	10.8	108	105.2	24.3	168	163.7	37.8	228	222.2	51.3	288	280.6	64.8
49	47.7	11.0	109	106.2	24.5	169	164.7	38.0	229	223.1	51.5	289	281.6	65.0
50	48.7	11.2	110	107.2	24.7	170	165.6	38.2	230	224.1	51.7	290	282.6	65.2
51	49.7	11.5	111	108.2	25.0	171	166.6	38.5	231	225.1	52.0	291	283.5	65.5
52	50.7	11.7	112	109.1	25.2	172	167.6	38.7	232	226.1	52.2	292	284.5	65.7
53	51.6	11.9	113	110.1	25.4	173	168.6	38.9	233	227.0	52.4	293	285.5	65.9
54	52.6	12.1	114	111.1	25.6	174	169.5	39.1	234	228.0	52.6	294	286.5	66.1
55	53.6	12.4	115	112.1	25.9	175	170.5	39.4	235	229.0	52.9	295	287.4	66.4
56	54.6	12.6	116	113.0	26.1	176	171.5	39.6	236	230.0	53.1	296	288.4	66.6
57	55.5	12.8	117	114.0	26.3	177	172.5	39.8	237	230.9	53.3	297	289.4	66.8
58	56.5	13.0	118	115.0	26.5	178	173.4	40.0	238	231.9	53.5	298	290.4	67.0
59	57.5	13.3	119	116.0	26.8	179	174.4	40.3	239	232.9	53.8	299	291.3	67.3
60	58.5	13.5	120	116.9	27.0	180	175.4	40.5	240	233.8	54.0	300	292.3	67.5
Dist	Dep.	Lat.	Dist	Dep	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.

For 77 Degrees.

TABLE II.

Difference of Latitude and Departure for 14 Degrees.

Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat	Dep.	Dist	Lat.	Dep.	Dist	Lat	Dep.
1	01.0	00.2	61	59.2	14.8	121	117.4	29.3	181	175.6	43.8	241	233.8	58.3
2	01.9	00.5	62	60.2	15.0	122	118.4	29.5	182	176.6	44.0	242	234.8	58.5
3	02.9	00.7	63	61.1	15.2	123	119.3	29.8	183	177.6	44.3	243	235.8	58.8
4	03.9	01.0	64	62.1	15.5	124	120.3	30.0	184	178.5	44.5	244	236.8	59.0
5	04.9	01.2	65	63.1	15.7	125	121.3	30.2	185	179.5	44.8	245	237.7	59.3
6	05.8	01.5	66	64.0	16.0	126	122.3	30.5	186	180.5	45.0	246	238.7	59.5
7	06.8	01.7	67	65.0	16.2	127	123.2	30.7	187	181.4	45.2	247	239.7	59.8
8	07.8	01.9	68	66.0	16.5	128	124.2	31.0	188	182.4	45.5	248	240.6	60.0
9	08.7	02.2	69	67.0	16.7	129	125.2	31.2	189	183.4	45.7	249	241.6	60.2
10	09.7	02.4	70	67.9	16.9	130	126.1	31.4	190	184.4	46.0	250	242.6	60.5
11	10.7	02.7	71	68.9	17.2	131	127.1	31.7	191	185.3	46.2	251	243.5	60.7
12	11.6	02.9	72	69.9	17.4	132	128.1	31.9	192	186.3	46.4	252	244.5	61.0
13	12.6	03.1	73	70.8	17.7	133	129.0	32.2	193	187.3	46.7	253	245.5	61.2
14	13.6	03.4	74	71.8	17.9	134	130.0	32.4	194	188.2	46.9	254	246.5	61.4
15	14.6	03.6	75	72.8	18.1	135	131.0	32.7	195	189.2	47.2	255	247.4	61.7
16	15.5	03.9	76	73.7	18.4	136	132.0	32.9	196	190.2	47.4	256	248.4	61.9
17	16.5	04.1	77	74.7	18.6	137	132.9	33.1	197	191.1	47.7	257	249.4	62.2
18	17.5	04.4	78	75.7	18.9	138	133.9	33.4	198	192.1	47.9	258	250.3	62.4
19	18.4	04.6	79	76.7	19.1	139	134.9	33.6	199	193.1	48.1	259	251.3	62.7
20	19.4	04.8	80	77.6	19.4	140	135.8	33.9	200	194.1	48.4	260	252.3	62.9
21	20.4	05.1	81	78.6	19.6	141	136.8	34.1	201	195.0	48.6	261	253.2	63.1
22	21.3	05.3	82	79.6	19.8	142	137.8	34.4	202	196.0	48.9	262	254.2	63.4
23	22.3	05.6	83	80.5	20.1	143	138.8	34.6	203	197.0	49.1	263	255.2	63.6
24	23.3	05.8	84	81.5	20.3	144	139.7	34.8	204	197.9	49.4	264	256.2	63.9
25	24.3	06.0	85	82.5	20.6	145	140.7	35.1	205	198.9	49.6	265	257.1	64.1
26	25.2	06.3	86	83.4	20.8	146	141.7	35.3	206	199.9	49.8	266	258.1	64.4
27	26.2	06.5	87	84.4	21.0	147	142.6	35.6	207	200.9	50.1	267	259.1	64.6
28	27.2	06.8	88	85.4	21.3	148	143.6	35.8	208	201.8	50.3	268	260.0	64.8
29	28.1	07.0	89	86.4	21.5	149	144.6	36.0	209	202.8	50.6	269	261.0	65.1
30	29.1	07.3	90	87.3	21.8	150	145.5	36.3	210	203.8	50.8	270	262.0	65.3
31	30.1	07.5	91	88.3	22.0	151	146.5	36.5	211	204.7	51.0	271	263.0	65.6
32	31.0	07.7	92	89.3	22.3	152	147.5	36.8	212	205.7	51.3	272	263.9	65.8
33	32.0	08.0	93	90.2	22.5	153	148.5	37.0	213	206.7	51.5	273	264.9	66.0
34	33.0	08.2	94	91.2	22.7	154	149.4	37.3	214	207.6	51.8	274	265.9	66.3
35	34.0	08.5	95	92.2	23.0	155	150.4	37.5	215	208.6	52.0	275	266.8	66.5
36	34.9	08.7	96	93.1	23.2	156	151.4	37.7	216	209.6	52.3	276	267.8	66.8
37	35.9	09.0	97	94.1	23.5	157	152.3	38.0	217	210.6	52.5	277	268.8	67.0
38	36.9	09.2	98	95.1	23.7	158	153.3	38.2	218	211.5	52.7	278	269.7	67.3
39	37.8	09.4	99	96.1	24.0	159	154.3	38.5	219	212.5	53.0	279	270.7	67.5
40	38.8	09.7	100	97.0	24.2	160	155.2	38.7	220	213.5	53.2	280	271.7	67.7
41	39.8	09.9	101	98.0	24.4	161	156.2	38.9	221	214.4	53.5	281	272.7	68.0
42	40.8	10.2	102	99.0	24.7	162	157.2	39.2	222	215.4	53.7	282	273.6	68.2
43	41.7	10.4	103	99.9	24.9	163	158.2	39.4	223	216.4	53.9	283	274.6	68.5
44	42.7	10.6	104	100.9	25.2	164	159.1	39.7	224	217.3	54.2	284	275.6	68.7
45	43.7	10.9	105	101.9	25.4	165	160.1	39.9	225	218.3	54.4	285	276.5	68.9
46	44.6	11.1	106	102.9	25.6	166	161.1	40.2	226	219.3	54.7	286	277.5	69.2
47	45.6	11.4	107	103.8	25.9	167	162.0	40.4	227	220.3	54.9	287	278.5	69.4
48	46.6	11.6	108	104.8	26.1	168	163.0	40.6	228	221.2	55.2	288	279.4	69.7
49	47.5	11.9	109	105.8	26.4	169	164.0	40.9	229	222.2	55.4	289	280.4	69.9
50	48.5	12.1	110	106.7	26.6	170	165.0	41.1	230	223.2	55.6	290	281.4	70.2
51	49.5	12.3	111	107.7	26.9	171	165.9	41.4	231	224.1	55.9	291	282.4	70.4
52	50.5	12.6	112	108.7	27.1	172	166.9	41.6	232	225.1	56.1	292	283.3	70.6
53	51.4	12.8	113	109.6	27.3	173	167.9	41.9	233	226.1	56.4	293	284.3	70.9
54	52.4	13.1	114	110.6	27·6	174	168.8	42.1	234	227.0	56.6	294	285.3	71.1
55	53.4	13.3	115	111.6	27.8	175	169.8	42.3	235	228.0	56.9	295	286.2	71.4
56	54.3	13.5	116	112.6	28.1	176	170.8	42.6	236	229.0	57.1	296	287.2	71.6
57	55.3	13.8	117	113.5	28.3	177	171.7	42.8	237	230.0	57.3	297	288.2	71.9
58	56.3	14.0	118	114.5	28.6	178	172.7	43.1	238	230.9	57.6	298	289.1	72.1
59	57.2	14.3	119	115.5	28.8	179	173.7	43.3	239	231.9	57.8	299	290.1	72.3
60	58.2	14.5	120	116.4	29.0	180	174.7	43.5	240	232.9	58.1	300	291.1	72.6
Dist	Dep.	Lat.	Dist	Dep	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.

For 76 Degrees.

TABLE II.

Difference of Latitude and Departure for 15 Degrees.

Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.
1	01.0	00.3	61	58.9	15.8	121	116.9	31.3	181	174.8	46.8	241	232.8	62.4
2	01.9	00.5	62	59.9	16.0	122	117.8	31.6	182	175.8	47.1	242	233.8	62.6
3	02.9	00.8	63	60.9	16.3	123	118.8	31.8	183	176.8	47.4	243	234.7	62.9
4	03.9	01.0	64	61.8	16.6	124	119.8	32.1	184	177.7	47.6	244	235.7	63.2
5	04.8	01.3	65	62.8	16.8	125	120.7	32.4	185	178.7	47.9	245	236.7	63.4
6	05.8	01.6	66	63.8	17.1	126	121.7	32.6	186	179.7	48.1	246	237.6	63.7
7	06.8	01.8	67	64.7	17.3	127	122.7	32.9	167	180.6	48.4	247	238.6	63.9
8	07.7	02.1	68	65.7	17.6	128	123.6	33.1	188	181.6	48.7	248	239.5	64.2
9	08.7	02.3	69	66.6	17.9	129	124.6	33.4	189	182.6	48.9	249	240.5	64.4
10	09.7	02.6	70	67.6	18.1	130	125.6	33.6	190	183.5	49.2	250	241.5	64.7
11	10.6	02.8	71	68.6	18.4	131	126.5	33.9	191	184.5	49.4	251	242.4	65.0
12	11.6	03.1	72	69.5	18.6	132	127.5	34.2	192	185.5	49.7	252	243.4	65.2
13	12,6	03.4	73	70.5	18.9	133	128.5	34.4	193	186.4	50.0	253	244.4	65.5
14	13.5	03.6	74	71.5	19.2	134	129.4	34.7	194	187.4	50.2	254	245.3	65.7
15	14.5	03.9	75	72.4	19.4	135	130.4	34.9	195	188.4	50.5	255	246.3	66.0
16	15.5	04.1	76	73.4	19.7	136	131.4	35.2	196	189.3	50.7	256	247.3	66.3
17	16.4	04.4	77	74.4	19.9	137	132.3	35.5	197	190.3	51.0	257	248.2	66.5
18	17.4	04.7	78	75.3	20.2	138	133.3	35.7	198	191.3	51.2	258	249.2	66.8
19	18.4	04.9	79	76.3	20.4	139	134.3	36.0	199	192.2	51.5	259	250.2	67.0
20	19.3	05.2	80	77.3	20.7	140	135.2	36.2	200	193.2	51.8	260	251.1	67.3
21	20.3	05.4	81	78.2	21.0	141	136.2	36.5	201	194.2	52.0	261	252.1	67.6
22	21.3	05.7	82	79.2	21.2	142	137.2	36.8	202	195.1	52.3	262	253.1	67.8
23	22.2	06.0	83	80.2	21.5	143	138.1	37.0	203	196.1	52.5	263	254.0	68.1
24	23.2	06.2	84	81.1	21.7	144	139.1	37.3	204	197.0	52.8	264	255.0	68.3
25	24.1	06.5	85	82.1	22.0	145	140.1	37.5	205	198.0	53.1	265	256.0	68.6
26	25.1	06.7	86	83.1	22.3	146	141.0	37.8	206	199.0	53.3	266	256.9	68.8
27	26.1	07.0	87	84.0	22.5	147	142.0	38.0	207	199.9	53.6	267	257.9	69.1
28	27.0	07.2	88	85.0	22.8	148	143.0	38.3	208	200.9	53.8	268	258.9	69.4
29	28.0	07.5	89	86.0	23.0	149	143.9	38.6	209	201.9	54.1	269	259.8	69.6
30	29.0	07.8	90	86.9	23.3	150	144.9	38.8	210	202.8	54.4	270	260.8	69.9
31	29.9	08.0	91	87.9	23.6	151	145.9	39.1	211	203.8	54.6	271	261.8	70.1
32	30.9	08.3	92	88.9	23.8	152	146.8	39.3	212	204.8	54.9	272	262.7	70.4
33	31.9	08.5	93	89.8	24.1	153	147.8	39.6	213	205.7	55.1	273	263.7	70.7
34	32.8	08.8	94	90.8	24.3	154	148.8	39.9	214	206.7	55.4	274	264.7	70.9
35	33.8	09.1	95	91.8	24.6	155	149.7	40.1	215	207.7	55.6	275	265.6	71.2
36	34.8	09.3	96	92.7	24.8	156	150.7	40.4	216	208.6	55.9	276	266.6	71.4
37	35.7	09.6	97	93.7	25.1	157	151.7	40.6	217	209.6	56.2	277	267.6	71.7
38	36.7	09.8	98	94.7	25.4	158	152.6	40.4	218	210.6	56.4	278	268.5	72.0
39	37.7	10.1	99	95.6	25.6	159	153.6	41.2	219	211.5	56.7	279	269.5	72.2
40	38.6	10.4	100	96.6	25.9	160	154.5	41.4	220	212.5	56.9	280	270.5	72.5
41	39.6	10.6	101	97.6	26.1	161	155.5	41.7	221	213.5	57.2	281	271.4	72.7
42	40.6	10.9	102	98.5	26.4	162	156.5	41.9	222	214.4	57.5	282	272.4	73.0
43	41.5	11.1	103	99.5	26.7	163	157.4	42.2	223	215.4	57.7	283	273.4	73.2
44	42.5	11.4	104	100.5	26.9	164	158.4	42.4	224	216.4	58.0	284	274.3	73.5
45	43.5	11.6	105	101.4	27.2	165	159.4	42.7	225	217.3	58.2	285	275.3	73.8
46	44.4	11.9	106	102.4	27.4	166	160.3	43.0	226	218.3	58.5	286	276.3	74.0
47	45.4	12.2	107	103.4	27.7	167	161.3	43.2	227	219.3	58.8	287	277.2	74.3
48	46.4	12.4	108	104.3	28.0	168	162.3	43.5	228	220.2	59.0	288	278.2	74.5
49	47.3	12.7	109	105.3	28.2	169	163.2	43.7	229	221.2	59.3	289	279.2	74.8
50	48.3	12.9	110	106.3	28.5	170	164.2	44.0	230	222.2	59.5	290	280.1	75.1
51	49.3	13.2	111	107.2	28·7	171	165.2	44.3	231	223.1	59.8	201	281.1	75.3
52	50.2	13.5	112	108.2	29.0	172	166.1	44.5	232	224.1	60.0	292	282.1	75.6
53	51.2	13.7	113	109.1	29.2	173	167.1	44.8	233	225.1	60.3	293	283.0	75.8
54	52.2	14.0	114	110.1	29.5	174	168.1	45.0	234	226.0	60.6	294	284.0	76.1
55	53.1	14.2	115	111.1	29.8	175	169.0	45.3	235	227.0	60.8	295	284.9	76.4
56	54.1	14.5	116	112.0	30.0	176	170.0	45.6	236	228.0	61.1	296	285.9	76.6
57	55.1	14.8	117	113.0	30.3	177	171.0	45.8	237	228.9	61.3	297	286.9	76.9
58	56.0	15.0	118	114.0	30.5	178	171.9	46.1	238	229.9	61.6	298	287.8	77.1
59	57.0	15.3	119	114.9	30.8	179	172.9	46.3	239	230.9	61.9	299	288.8	77.4
60	58.0	15.5	120	115.9	31.1	180	173.9	46.6	240	231.8	62.1	300	289.8	77.6
Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.

For 75 Degrees.

TABLE II.

Difference of Latitude and Departure for 16 Degrees.

Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.
1	01.0	00.3	61	58.6	16.8	121	116.3	33.4	181	174.0	49.9	241	231.7	66.4
2	01.9	00.6	62	59.6	17.1	122	117.3	33.6	182	174.9	50.2	242	232.6	66.7
3	02.9	00.8	63	60.6	17.4	123	118.2	33.9	183	175.9	50.4	243	233.6	67.0
4	03.8	01.1	64	61.5	17.6	124	119.2	34.2	184	176.9	50.7	244	234.5	67.3
5	04.8	01.4	65	62.5	17.9	125	120.2	34.5	185	177.8	51.0	245	235.5	67.5
6	05.8	01.7	66	63.4	18.2	126	121.1	34.7	186	178.8	51.3	246	236.5	67.8
7	06.7	01.9	67	64.4	18.5	127	122.1	35.0	187	179.8	51.5	247	337.4	68.1
8	07.7	02.2	68	65.4	18.7	128	123.0	35.3	188	180.7	51.8	248	238.4	68.4
9	08.7	02.5	69	66.3	19.0	129	124.0	35.6	189	181.7	52.1	249	239.4	68.6
10	09.6	02.8	70	67.3	19.3	130	125.0	35.8	190	182.6	52.4	250	240.3	68.9
11	10.6	03.0	71	68.2	19.6	131	125.9	36.1	191	183.6	52.6	251	241.3	69.2
12	11.5	03.3	72	69.2	19.8	132	126.9	36.4	192	184.6	52.9	252	242.2	69.5
13	12.5	03.6	73	70.2	20.1	133	127.8	36.7	193	185.5	53.2	253	243.2	69.7
14	13.5	03.9	74	71.1	20.4	134	128.8	36.9	194	186.5	53.5	254	244.2	70.0
15	14.4	04.1	75	72.1	20.7	135	129.8	37.2	195	187.4	53.7	255	245.1	70.3
16	15.4	04.4	76	73.1	20.9	136	130.7	37.5	196	188.4	54.0	256	246.1	70.6
17	16.3	04.7	77	74.0	21.2	137	131.7	37.8	197	189.4	54.3	257	247.0	70.8
18	17.3	05.0	78	75.0	21.5	138	132.7	38.0	198	190.3	54.6	258	248.0	71.1
19	18.3	05.2	79	75.9	21.8	139	133.6	38.3	199	191.3	54.9	259	249.0	71.4
20	19.2	05.5	80	76.9	22.1	140	134.6	38.6	200	192.3	55.1	260	249.9	71.7
21	20.2	05.8	81	77.9	22.3	141	135.5	38.9	201	193.2	55.4	261	250.9	71.9
22	21.1	06.1	82	78.8	22.6	142	136.5	39.1	202	194.2	55.7	262	251.9	72.2
23	22.1	06.3	83	79.8	22.9	143	137.5	39.4	203	195.1	56.0	263	252.8	72.5
24	23.1	06.6	84	80.7	23.2	144	138.4	39.7	204	196.1	56.2	264	253.8	72.8
25	24.0	06.9	85	81.7	23.4	145	139.4	40.0	205	197.1	56.5	265	254.7	73.0
26	25.0	07.2	86	82.7	23.7	146	140.3	40.2	206	198.0	56.8	266	255.7	73.3
27	26.0	07.4	87	83.6	24.0	147	141.3	40.5	207	199.0	57.1	267	256.7	73.6
28	26.9	07.7	88	84.6	24.3	148	142.3	40.8	208	199.9	57.3	268	257.6	73.9
29	27.9	08.0	89	85.6	24.5	149	143.2	41.1	209	200.9	57.6	269	258.6	74.1
30	28.8	08.3	90	86.5	24.8	150	144.2	41.3	210	201.9	57.9	270	259.5	74.4
31	29.8	08.5	91	87.5	25.1	151	145.2	41.6	211	202.8	58.2	271	260.5	74.7
32	30.8	08.8	92	88.4	25.4	152	146.1	41.9	212	203.8	58.4	272	261.5	75.0
33	31.7	09.1	93	89.4	25.6	153	147.1	42.2	213	204.7	58.7	273	262.4	75.2
34	32.7	09.4	94	90.4	25.9	154	148.0	42.4	214	205.7	59.0	274	263.4	75.5
35	33.6	09.6	95	91.3	26.2	155	149.0	42.7	215	206.7	59.3	275	264.3	75.8
36	34.6	09.9	96	92.3	26.5	156	150.0	43.0	216	207.6	59.5	276	265.3	76.1
37	35.6	10.2	97	93.2	26.7	157	150.9	43.3	217	208.6	59.8	277	266.3	76.4
38	36.5	10.5	98	94.2	27.0	158	151.9	43.6	218	209.6	60.1	278	267.2	76.6
39	37.5	10.7	99	95.2	27.3	159	152.8	43.8	219	210.5	60.4	279	268.2	76.9
40	38.5	11.0	100	96.1	27.6	160	153.8	44.1	220	211.5	60.6	280	269.2	77.2
41	39.4	11.3	101	97.1	27.8	161	154.8	44.4	221	212.4	60.9	281	270.1	77.5
42	40.4	11.6	102	98.0	28.1	162	155.7	44.7	222	213.4	61.2	282	271.1	77.7
43	41.3	11.9	103	99.0	28.4	163	156.7	44.9	223	214.4	61.5	283	272.0	78.0
44	42.3	12.1	104	100.0	28.7	164	157.6	45.2	224	215.3	61.7	284	273.0	78.3
45	43.3	12.4	105	100.9	28.9	165	158.6	45.5	225	216.3	62.0	285	274.0	78.6
46	44.2	12.7	106	101.9	29.2	166	159.6	45.8	226	217.2	62.3	286	274.9	78.8
47	45.2	13.0	107	102.9	29.5	167	160.5	46.0	227	218.2	62.6	287	275.9	79.1
48	46.1	13.2	108	103.8	29.8	168	161.5	46.3	228	219.2	62.8	288	276.8	79.4
49	47.1	13.5	109	104.8	30.0	169	162.5	46.6	229	220.1	63.1	289	277.8	79.7
50	48.1	13.8	110	105.7	30.3	170	163.4	46.9	230	221.1	63.4	290	278.8	79.9
51	49.0	14.1	111	106.7	30.6	171	164.4	47.1	231	222.1	63.7	291	279.7	80.2
52	50.0	14.3	112	107.7	80.9	172	165.3	47.4	232	223.0	63.9	292	280.7	80.5
53	50.9	14.6	113	108.6	31.1	173	166.3	47.7	233	224.0	64.2	293	281.6	80.8
54	51.9	14.9	114	109.6	31.4	174	167.3	48.0	234	224.9	64.5	294	282.6	81.0
55	52.9	15.2	115	110.5	31.7	175	168.2	48.2	235	225.9	64.8	295	283.6	81.3
56	53.8	15.4	116	111.5	32.0	176	169.2	48.5	236	226.9	65.1	296	284.5	81.6
57	54.8	15.7	117	112.5	32.2	177	170.1	48.8	237	227.8	65.3	297	285.5	81.9
58	55.8	16.0	118	113.4	32.5	178	171.1	49.1	238	228.8	65.6	298	286.5	82.1
59	56.7	16.3	119	114.4	32.8	179	172.1	49.3	239	229.7	65.9	299	287.4	82.4
60	57.7	16.5	120	115.4	33.1	180	173.0	49.6	240	230.7	66.2	300	288.4	82.7
Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.

For 74 Degrees.

TABLE II.

Difference of Latitude and Departure for 17 Degrees.

Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat	Dep.	Dist	Lat.	Dep.
1	01.0	00.3	61	58.3	17.8	121	115.7	35.4	181	173.1	52.9	241	230.5	70.5
2	01.9	00.6	62	59.3	18.1	122	116.7	35.7	182	174.0	53.2	242	231.4	70.8
3	02.9	00.9	63	60.2	18.4	123	117.6	36.0	183	175.0	53.5	243	232.4	71.0
4	03.8	01.2	64	61.2	18.7	124	118.6	36.3	184	176.0	53.8	244	233.3	71.3
5	04.8	01.5	65	62.2	19.0	125	119.5	36.5	185	176.9	54.1	245	234.3	71.6
6	05.7	01.8	66	63.1	19.3	126	120.5	36.8	186	177.9	54.4	246	235.3	71.9
7	06.7	02.0	67	64.1	19.6	127	121.5	37.1	187	178.8	54.7	247	236.2	72.2
8	07.7	02.3	68	65.0	19.9	128	122.4	37.4	188	179.8	55.0	248	237.2	72.5
9	08.6	02.6	69	66.0	20.2	129	123.4	37.7	189	180.7	55.3	249	238.1	72.8
10	09.6	02.9	70	66.9	20.5	130	124.3	38.0	190	181.7	55.6	250	239.1	73.1
11	10.5	03.2	71	67.9	20.8	131	125.3	38.3	191	182.7	55.8	251	240.0	73.4
12	11.5	03.5	72	68.9	21.1	132	126.2	38.6	192	183.6	56.1	252	241.0	73.7
13	12.4	03.8	73	69.8	21.3	133	127.2	38.9	193	184.6	56.4	253	241.9	74.0
14	13.4	04.1	74	70.8	21.6	134	128.1	39.2	194	185.5	56.7	254	242.9	74.3
15	14.3	04.4	75	71.7	21.9	135	129.1	39.5	195	186.5	57.0	255	243.9	74.6
16	15.3	04.7	76	72.7	22.2	136	130·1	39.8	196	187.4	57.3	256	244.8	74.8
17	16.3	05.0	77	73.6	22.5	137	131.0	40.1	197	188.4	57.6	257	245.8	75.1
18	17.2	05.3	78	74.6	22.8	138	132.0	40.3	198	189.3	57.9	258	246.7	75.4
19	18.2	05.6	79	75.5	23.1	139	132.9	40.6	199	190.3	58.2	259	247.7	75.7
20	19.1	05.8	80	76.5	23.3	140	133.9	40.9	200	191.3	58.5	260	248.6	76.0
21	20.1	06.1	81	77.5	23.7	141	134.8	41.2	201	192.2	58.8	261	249.6	76.3
22	21.0	06.4	82	78.4	24.0	142	135.8	41.5	202	193.2	59.1	262	250.6	76.6
23	22.0	06.7	83	79.4	24.3	143	136.8	41.8	203	194.1	59.4	263	251.5	76.9
24	23.0	07.0	84	80.3	24.6	144	137.7	42.1	204	195.1	59.6	264	252.5	77.2
25	23.9	07.3	85	81.3	24.9	145	138.7	42.4	205	196.0	59.9	265	253.4	77.5
26	24.9	07.6	86	82.2	25.1	146	139.6	42.7	206	197.0	60.2	266	254.4	77.8
27	25.8	07.9	87	83.2	25.4	147	140.6	43.0	207	198.0	60.5	267	255.3	78.1
28	26.8	08.2	88	84.2	25.7	148	141.5	43.3	208	198.9	60.8	268	256.3	78.4
29	27.7	08.5	89	85.1	26.0	149	142.5	43.6	209	199.9	61.1	269	257.2	78.6
30	28.7	08.8	90	86.1	26.3	150	143.4	43.9	210	200.8	61.4	270	258.2	78.9
31	29.6	09.1	91	87.0	26.6	151	144.4	44.1	211	201.8	61.7	271	259.2	79.2
32	30.6	09.4	92	88.0	26.9	152	145.4	44.4	212	202.7	62.0	272	260.1	79.5
33	31.6	09.6	93	88.9	27.2	153	146.3	44.7	213	203.7	62.3	273	261.1	79.8
34	32.5	09.9	94	89.9	27.5	154	147.3	45.0	214	204.6	62.6	274	262.0	80.1
35	33.5	10.2	95	90.8	27.8	155	148.2	45.3	215	205.6	62.9	275	263.0	80.4
36	34.4	10.5	96	91.8	28.1	156	149.2	45.6	216	206.6	63.2	276	263.9	80.7
37	35.4	10.8	97	92.8	28.4	157	150.1	45.9	217	207.5	63.4	277	264.9	81.0
38	36.3	11.1	98	93.7	28.7	158	151.1	46.2	218	208.5	63.7	278	265.9	81.3
39	37.3	11.4	99	94.7	28.9	159	152.1	46.5	219	209.4	64.0	279	266.8	81.6
40	38.3	11.7	100	95.6	29.2	160	153.0	46.8	220	210.4	64.3	280	267.8	81.9
41	39.2	12.0	101	96.6	29.5	161	154.0	47.1	221	211.3	64.6	281	268.7	82.2
42	40.2	12.3	102	97.5	29.8	162	154.9	47.4	222	212.3	64.9	282	269.7	82.4
43	41.1	12.6	103	98.5	30.1	163	155.9	47.7	223	213.3	65.2	283	270.6	82.7
44	42.1	12.9	104	99.5	30.4	164	156.8	47.9	224	214.2	65.5	284	271.6	83.0
45	43.0	13.2	105	100.4	30.7	165	157.8	48.2	225	215.2	65.8	285	272.5	83.3
46	44.0	13.4	106	101.4	31.0	166	158.7	48.5	226	216.1	66.1	286	273.5	83.6
47	44.9	13.7	107	102.3	31.3	167	159.7	48.8	227	217.1	66.4	287	274.5	83.9
48	45.9	14.0	108	103.3	31.6	168	160.7	49.1	228	218.0	66.7	288	275.4	84.2
49	46.9	14.3	109	104.2	31.9	169	161.6	49.4	229	219.0	67.0	289	276.4	84.5
50	47.8	14.6	110	105.2	32.2	170	162.6	49.7	230	220.0	67.2	290	277.3	84.8
51	48.8	14.9	111	106.1	32.5	171	163.5	50.0	231	220.9	67.5	291	278.3	85.1
52	49.7	15.2	112	107.1	32.7	172	164.5	50.3	232	221.9	67.8	292	279.2	85.4
53	50.7	15.5	113	108.1	33.0	173	165.4	50.6	233	222.8	68.1	293	280.2	85.7
54	51.6	15.8	114	109.0	33.3	174	166.4	50.9	234	223.8	68.4	294	281.2	86.0
55	52.6	16.1	115	110.0	33.6	175	167.4	51.2	235	224.7	68.7	295	282.1	86.2
56	53.6	16.4	116	110.9	33.9	176	168.3	51.5	236	225.7	69.0	296	283.1	86.5
57	54.5	16.7	117	111.9	34.2	177	169.3	51.7	237	226.6	69.3	297	284.0	86.8
58	55.5	17.0	118	112.8	34.5	178	170.2	52.0	238	227.6	69.6	298	285.0	87.1
59	56.4	17.2	119	113.8	34.8	179	171.2	52.3	239	228.6	69.9	299	285.9	87.4
60	57.4	17.5	120	114.8	35.1	180	172.1	52.6	240	229.5	70.2	300	286.9	87.7
Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.

For 73 Degrees.

TABLE II.

Difference of Latitude and Departure for 18 Degrees.

Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.
1	01.0	00.3	61	58.0	18.9	121	115.1	37.4	181	172.1	55.9	241	229.2	74.5
2	01.9	00.6	62	59.0	19.2	122	116.0	37.7	182	173.1	56.2	242	230.2	74.8
3	02.9	00.9	63	59.9	19.5	123	117.0	38.0	183	174.0	56.6	243	231.1	75.1
4	03.8	01.2	64	60.9	19.8	124	117.9	38.3	184	175.0	56.9	244	232.1	75.4
5	04.8	01.5	65	61.8	20.1	125	118.9	38.6	185	175.9	57.2	245	233.0	75.7
6	05.7	01.9	66	62.8	20.4	126	119.8	38.9	186	176.9	57.5	246	234.0	76.0
7	06.7	02.2	67	63.7	20.7	127	120.8	39.2	187	177.8	57.8	247	234.9	76.3
8	07.6	02.5	68	64.7	21.0	128	121.7	39.6	188	178.8	58.1	248	235.9	76.6
9	08.6	02.8	69	65.6	21.3	129	122.7	39.9	189	179.7	58.4	249	236.8	76.9
10	09·5	03.1	70	66.6	21.6	130	123.6	40.2	190	180.7	58.7	250	237.8	77.3
11	10.5	03.4	71	67.5	21.9	131	124.6	40.5	191	181·7	59.0	251	238.7	77.6
12	11.4	03.7	72	68.5	22.2	132	125.5	40.8	192	182.6	59.3	252	239.7	77.9
13	12.4	04.0	73	69.4	22.6	133	126.5	41.1	193	183.6	59.6	253	240.6	78.2
14	13.3	04.3	74	70.4	22.9	134	127.4	41.4	194	184.5	59.9	254	241.6	78.5
15	14.3	04.6	75	71.3	23.2	135	128.4	41.7	195	185.5	60.3	255	242.5	78.8
16	15.2	04.9	76	72.3	23.5	136	129.3	42.0	196	186.4	60.6	256	243.5	79.1
17	16.2	05.3	77	73.2	23.8	137	130.3	42.3	197	187.4	60.9	257	244.4	79.4
18	17.1	05.6	78	74.2	24.1	138	131.2	42.6	198	188.3	61.2	258	245.4	79.7
19	18.1	05.9	79	75.1	24.4	139	132.2	43.0	199	189.3	61.5	259	246.3	80.0
20	19.0	06.2	80	76.1	24.7	140	133.1	43.3	200	190.2	61.8	260	247.3	80.3
21	20.0	06.5	81	77.0	25.0	141	134.1	43.6	201	191.2	62.1	261	248.2	80.7
22	20.9	06.8	82	78.0	25.3	142	135.1	43.9	202	192.1	62.4	262	249.2	81.0
23	21.9	07.1	83	78.9	25.6	143	136.0	44.2	203	193.1	62.7	263	250.1	81.3
24	22.8	07.4	84	79.9	26.0	144	137.0	44.5	204	194.0	63.0	264	251.1	81.6
25	23.8	07.7	85	80.8	26.3	145	137.9	44.8	205	195.0	63.3	265	252.0	81.9
26	24.7	08.0	86	81.8	26.6	146	138.9	45.1	206	195.9	63.7	266	253.0	82.2
27	25.7	08.3	87	82.7	26.9	147	139.8	45.4	207	196.9	64.0	267	253.9	82.5
28	26.6	08.7	88	83.7	27.2	148	140.8	45.7	208	197.8	64.3	268	254.9	82.8
29	27.6	09.0	89	84.6	27.5	149	141.7	46.0	209	198.8	64.6	269	255.8	83.1
30	28.5	09.3	90	85.6	27.8	150	142.7	46.4	210	199.7	64.9	270	256.8	83.4
31	29.5	09.6	91	86.5	28.1	151	143.6	46.7	211	200.7	65.2	271	257.7	83.7
32	30.4	09.9	92	87.5	28.4	152	144.6	47.0	212	201.6	65.5	272	258.7	84.1
33	31.4	10.2	93	88.4	28.7	153	145.5	47.3	213	202.6	65.8	273	259.6	84.4
34	32.3	10.5	94	89.4	29.0	154	146.5	47.6	214	203.5	66.1	274	260.6	84.7
35	33.3	10.8	95	90.4	29.4	155	147.4	47.9	215	204.5	66.4	275	261.5	85.0
36	34.2	11.1	96	91.3	29.7	156	148.4	48.2	216	205.4	66.7	276	262.5	85.3
37	35.2	11.4	97	92.3	30.0	157	149.3	48.5	217	206.4	67.1	277	263.4	85.6
38	36.1	11.7	98	93.2	30.3	158	150.3	48.8	218	207.3	67.4	278	264.4	85.9
39	37.1	12.1	99	94.2	30.6	159	151.2	49.1	219	208.3	67.7	279	265.3	86.2
40	38.0	12.4	100	95.1	30.9	160	152.2	49.4	220	209.2	68.0	280	266.3	86.5
41	39.0	12.7	101	96.1	31.2	161	153.1	49.8	221	210.2	68.3	281	267.2	86.8
42	39.9	13.0	102	97.0	31.5	162	154.1	50.1	222	211.1	68.6	282	268.2	87.1
43	40.9	13.3	103	98.0	31.8	163	155.0	50.4	223	212.1	68.9	283	269.1	87.5
44	41.8	13.6	104	98.9	32.1	164	156.0	50.7	224	213.0	69.2	284	270.1	87.8
45	42.8	13.9	105	99.9	32.4	165	156.9	51.0	225	214.0	69.5	285	271.1	88.1
46	43.7	14.2	106	100.8	32.8	166	157.9	51.3	226	214.9	69.8	286	272.0	88.4
47	44.7	14.5	107	101.8	33.1	167	158.8	51.6	227	215.9	70.1	287	273.0	88.7
48	45.7	14.8	108	102.7	33.4	168	159.8	51.9	228	216.8	70.5	288	273.9	89.0
49	46.6	15.1	109	103.7	33.7	169	160.7	52.2	229	217.8	70.8	289	274.9	89.3
50	47.6	15.5	110	104.6	34.0	170	161.7	52.5	230	218.7	71.1	290	275.8	89.6
51	48.5	15.8	111	105.6	34.3	171	162.6	52.8	231	219.7	71.4	291	276.8	89.9
52	49.5	16.1	112	106.5	34.6	172	163.6	53.2	232	220.6	71.7	292	277.7	90.2
53	50.4	16.4	113	107.5	34.9	173	164.5	53.5	233	221.6	72.0	293	278.7	90.5
54	51.4	16.7	114	108.4	35.2	174	165.5	53.8	234	222.5	72.3	294	279.6	90.9
55	52.3	17.0	115	109.4	35.5	175	166.4	54.1	235	223.5	72.6	295	280.6	91.2
56	53.3	17.3	116	110.3	35.8	176	167.4	54.4	236	224.4	72.9	296	281.5	91.5
57	54.2	17.6	117	111.3	36.2	177	168.3	54.7	237	225.4	73.2	297	282.5	91.8
58	55.2	17.9	118	112.2	36.5	178	169.3	55.0	238	226.4	73.5	298	283.4	92.1
59	56.1	18.2	119	113.2	36.8	179	170.2	55.3	239	227.3	73.9	299	284.4	92.4
60	57.1	18.5	120	114.1	37.1	180	171.2	55.6	240	228.3	74.2	300	285.3	92.7
Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.

For 72 Degrees.

TABLE II.

Difference of Latitude and Departure for 19 Degrees.

Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.
1	00.9	00.3	61	57.7	19.9	121	114.4	39.4	181	171.1	58.9	241	227.9	78.5
2	01.9	00.7	62	58.6	20.2	122	115.4	39.7	182	172.1	59.3	242	228.8	78.8
3	02.8	01.0	63	59.6	20.5	123	116.3	40.0	183	173.0	59.6	243	229.8	79.1
4	03.8	01.3	64	60.5	20.8	124	117.2	40.4	184	174.0	59.9	244	230.7	79.4
5	04.7	01.6	65	61.5	21.2	125	118.2	40.7	185	174.9	60.2	245	231.7	79.8
6	05.7	02.0	66	62.4	21.5	126	119.1	41.0	186	175.9	60.6	246	232.6	80.1
7	06.6	02.3	67	63.3	21.8	127	120.1	41.3	187	176.8	60.9	247	233.5	80.4
8	07.6	02.6	68	64.3	22.1	128	121.0	41.7	188	177.8	61.2	248	234.5	80.7
9	08.5	02.9	69	65.2	22.5	129	122.0	42.0	189	178.7	61.5	249	235.4	81.1
10	09.5	03.3	70	66.2	22.8	130	122.9	42.3	190	179.6	61.9	250	236.4	81.4
11	10.4	03.6	71	67.1	23.1	131	123.9	42.6	191	180.6	62.2	251	237.3	81.7
12	11.3	03.9	72	68.1	23.4	132	124.8	43.0	192	181.5	62.5	252	238.3	82.0
13	12.3	04.2	73	69.0	23.8	133	125.8	43.3	193	182.5	62.8	253	239.2	82.4
14	13.2	04.6	74	70.0	24.1	134	126.7	43.6	194	183.4	63.2	254	240.2	82.7
15	14.2	04.9	75	70.9	24.4	135	127.6	44.0	195	184.4	63.5	255	241.1	83.0
16	15.1	05.2	76	71.9	24.7	136	128.6	44.3	196	185.3	63.8	256	242.1	83.3
17	16.1	05.5	77	72.8	25.1	137	129.5	44.6	197	186.3	64.1	257	243.0	83.7
18	17.0	05.9	78	73.8	25.4	138	130.5	44.9	198	187.2	64.5	258	243.9	84.0
19	18.0	06.2	79	74.7	25.7	139	131.4	45.3	199	188.2	64.8	259	244.9	84.3
20	18.9	06.5	80	75.6	26.0	140	132.4	45.6	200	189.1	65.1	260	245.8	84.6
21	19.9	06.8	81	76.6	26.4	141	133.3	45.9	201	190.0	65.4	261	246.8	85.0
22	20.8	07.2	82	77.5	26.7	142	134.3	46.2	202	191.0	65.8	262	247.7	85.3
23	21.7	07.5	83	78.5	27.0	143	135.2	46.6	203	191.9	66.1	263	248.7	85.6
24	22.7	07.8	84	79.4	27.3	144	136.2	46.9	204	192.9	66.4	264	249.6	86.0
25	23.6	08.1	85	80.4	27.7	145	137.1	47.2	205	193.8	66.7	265	250.6	86.3
26	24.6	08.5	86	81.3	28.0	146	138.0	47.5	206	194.8	67.1	266	251.5	86.6
27	25.5	08.8	87	82.3	28.3	147	139.0	47.9	207	195.7	67.4	267	252.5	86.9
28	26.5	09.1	88	83.2	28.7	148	139.9	48.2	208	196.7	67.7	268	253.4	87.3
29	27.4	09.4	89	84.2	29.0	149	140.9	48.5	209	197.6	68.0	269	254.3	87.6
30	28.4	09.8	90	85.1	29.3	150	141.8	48.8	210	198.6	68.4	270	255.3	87.9
31	29.3	10.1	91	86.0	29.6	151	142.8	49.2	211	199.5	68.7	271	256.2	88.2
32	30.3	10.4	92	87.0	30.0	152	143.7	49.5	212	200.4	69.0	272	257.2	88.6
33	31.2	10.7	93	87.9	30.3	153	144.7	49.8	213	201.4	69.3	273	258.1	88.9
34	32.1	11.1	94	88.9	30.6	154	145.6	50.1	214	202.3	69.7	274	259.1	89.2
35	33.1	11.4	95	89.8	30.9	155	146.6	50.5	215	203.3	70.0	275	260.0	89.5
36	34.0	11.7	96	90.8	31.3	156	147.5	50.8	216	204.2	70.3	276	261.0	89.9
37	35.0	12.0	97	91.7	31.6	157	148.4	51.1	217	205.2	70.6	277	261.9	90.2
38	35.9	12.4	98	92.7	31.9	158	149.4	51.4	218	206.1	71.0	278	262.9	90.5
39	36.9	12.7	99	93.6	32.2	159	150.3	51.8	219	207.1	71.3	279	263.8	90.8
40	37.8	13.0	100	94.6	32.6	160	151.3	52.1	220	208.0	71.6	280	264.7	91.2
41	38.8	13.3	101	95.5	32.9	161	152.2	52.4	221	209.0	72.0	281	265.7	91.5
42	39.7	13.7	102	96.4	33.2	162	153.2	52.7	222	209.9	72.3	282	266.6	91.8
43	40.7	14.0	103	97.4	33.5	163	154.1	53.1	223	210.9	72.6	283	267.6	92.1
44	41.6	14.3	104	98.3	33.9	164	155.1	53.4	224	211.8	72.9	284	268.5	92.5
45	42.5	14.7	105	99.3	34.2	165	156.0	53.7	225	212.7	73.3	285	269.5	92.8
46	43.5	15.0	106	100.2	34.5	166	157.0	54.0	226	213.7	73.6	286	270.4	93.1
47	44.4	15.3	107	101.2	34.8	167	157.9	54.4	227	214.6	73.9	287	271.4	93.4
48	45.4	15.6	108	102.1	35.2	168	158.8	54.7	228	215.6	74.2	288	272.3	93.8
49	46.3	16.0	109	103.1	35.5	169	159.8	55.0	229	216.5	74.6	289	273.3	94.1
50	47.3	16.3	110	104.0	35.8	170	160.7	55.3	230	217.5	74.9	290	274.2	94.4
51	48.2	16.6	111	105.0	36.1	171	161.7	55.7	231	218.4	75.2	291	275.1	94.7
52	49.2	16.9	112	105.9	36.5	172	162.6	56.0	232	219.4	75.5	292	276.1	95.1
53	50.1	17.3	113	106.8	36.8	173	163.6	56.3	233	220.3	75.9	293	277.0	95.4
54	51.1	17.6	114	107.8	37.1	174	164.5	56.6	234	221.3	76.2	294	278.0	95.7
55	52.0	17.9	115	108.7	37.4	175	165.5	57.0	235	222.2	76.5	295	278.9	96.0
56	52.9	18.2	116	109.7	37.8	176	166.4	57.3	236	223.1	76.8	296	279.9	96.4
57	53.9	18.6	117	110.6	38.1	177	167.4	57.6	237	224.1	77.2	297	280.8	96.7
58	54.8	18.9	118	111.6	38.4	178	168.3	58.0	238	225.0	77.5	298	281.8	97.0
59	55.8	19.2	119	112.5	38.7	179	169.2	58.3	239	226.0	77.8	299	282.7	97.3
60	56.7	19.5	120	113.5	39.1	180	170.2	58.6	240	226.9	78.1	300	283.7	97.7
Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat	Dist	Dep.	Lat.

For 71 Degrees.

TABLE II.

Difference of Latitude and Departure for 20 Degrees.

Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.
1	00.9	00.3	61	57.3	20.9	121	113.7	41.4	181	170.1	61.9	241	226.5	82.4
2	01.9	00.7	62	58.3	21.2	122	114.6	41.7	132	171.0	62.2	242	227.4	82.8
3	02.8	01.0	63	59.2	21.5	123	115.6	42.1	183	172.0	62.6	243	228.3	83.1
4	03.8	01.4	64	60.1	21.9	124	116.5	42.4	184	172.9	62.9	244	229.3	83.5
5	04.7	01.7	65	61.1	22.2	125	117.5	42.8	185	173.8	63.3	245	230.2	83.8
6	05.6	02.1	66	62.0	22.6	126	118.4	43.1	186	174.8	63.6	246	231.2	84.2
7	06.6	02.4	67	63.0	22.9	127	119.3	43.4	187	175.7	64.0	247	232.1	84.5
8	07.5	02.7	68	63.9	23.3	128	120.3	43.8	188	176.7	64.3	248	233.0	84.8
9	08.5	03.1	69	64.8	23.6	129	121.2	44.1	189	177.6	64.6	249	234.0	85.2
10	09.4	04.4	70	65.8	23.9	130	122.2	44.5	190	178.5	65.0	250	234.9	85.5
11	10.3	03.8	71	66.7	24.3	131	123.1	44.8	191	179.5	65.3	251	235.9	85.8
12	11.3	04.1	72	67.7	24.6	132	124.0	45.1	192	180.4	65.7	252	236.8	86.2
13	12.2	04.4	73	68.6	25.0	133	125.0	45.5	193	181.4	66.0	253	237.7	86.5
14	13.2	04.8	74	69.5	25.3	134	125.9	45.8	194	182.3	66.4	254	238.7	86.9
15	14.1	05.1	75	70.5	25.7	135	126.9	46.2	195	183.2	66.7	255	239.6	87.2
16	15.0	05.5	76	71.4	26.0	136	127.8	46.5	196	184.2	67.0	256	240.6	87.6
17	16.0	05.8	77	72.4	26.3	137	128.7	46.9	197	185.1	67.4	257	241.5	87.9
18	16.9	06.2	78	73.3	26.7	138	129.7	47.2	198	186.1	67.7	258	242.4	88.2
19	17.9	06.5	79	74.2	27.0	139	130.6	47.5	199	187.0	68.1	259	243.4	88.6
20	18.8	06.8	80	75.2	27.4	140	131.6	47.9	200	187.9	68.4	260	244.3	88.9
21	19.7	07.2	81	76.1	27.7	141	132.5	48.2	201	188.9	68.7	261	245.3	89.3
22	20.7	07.5	82	77.1	28.0	142	133.4	48.6	202	189.8	69.1	262	246.2	89.6
23	21.6	07.9	83	78.0	28.4	143	134.4	48.9	203	190.8	69.4	263	247.1	90.0
24	22.6	08.2	84	78.9	28.7	144	135.3	49.3	204	191.7	69.8	264	248.1	90.3
25	23.5	08.6	85	79.9	29.1	145	136.3	49.6	205	192.6	70.1	265	249.0	90.6
26	24.4	08.9	86	80.8	29.4	146	137.2	49.9	206	193.6	70.5	266	250.0	91.0
27	25.4	09.2	87	81.8	29.8	147	138.1	50.3	207	194.5	70.8	267	250.9	91.3
28	26.3	09.6	88	82.7	30.1	148	139.1	50.6	208	195.5	71.1	268	251.8	91.7
29	27.3	09.9	89	83.6	30.4	149	140.0	51.0	209	196.4	71.5	269	252.8	92.0
30	28.2	10.3	90	84.6	30.8	150	141.0	51.3	210	197.3	71.8	270	253.7	92.3
31	29.1	10.6	91	85.5	31.1	151	141.9	51.6	211	198.3	72.2	271	254.7	92.7
32	30.1	10.9	92	86.5	31·5	152	142.8	52.0	212	199.2	72.5	272	255.6	93.0
33	31.0	11.3	93	87.4	31.8	153	143.8	52.3	213	200.2	72.9	273	256.5	93.4
34	31.9	11.6	94	88.3	32.1	154	144.7	52.7	214	201.1	73.2	274	257.5	93.7
35	32.9	12.0	95	89.3	32.5	155	145.7	53.0	215	202.0	73.5	275	258.4	94.1
36	33.8	12.3	96	90.2	32.8	156	146.6	53.4	216	203.0	73.9	276	259.4	94.4
37	34.8	12.7	97	91.2	33.2	157	147.5	53.7	217	203.9	74.2	277	260.3	94.7
38	35.7	13.0	98	92.1	33.5	158	148.5	54.0	218	204.9	74.6	278	261.2	95.1
39	36.6	13.3	99	93.0	33.9	159	149.4	54.4	219	205.8	74.9	279	262.2	95.4
40	37.6	13.7	100	94.0	34.2	160	150.4	54.7	220	206.7	75.2	280	263.1	95.8
41	38.5	14.0	101	94.9	34.5	161	151.3	55.1	221	207.7	75.6	281	264.1	96.1
42	39.5	14.4	102	95.8	34.9	162	152.2	55.4	222	208.6	75.9	282	265.0	96.4
43	40.4	14.7	103	96.8	35.2	163	153.2	55.7	223	209.6	76.3	283	265.9	96.8
44	41.3	15.0	104	97.7	35.6	164	154.1	56.1	224	210.5	76.6	284	266.9	97.1
45	42.3	15.4	105	98.7	35.9	165	155.0	56.4	225	211.4	77.0	285	267.8	97.5
46	43.2	15.7	106	99.6	36.3	166	156.0	56.8	226	212.4	77.3	286	268.8	97.8
47	44.2	16.1	107	100.5	36.6	167	156.9	57.1	227	213.3	77.6	287	269.7	98.2
48	45.1	16.4	108	101.5	36.9	168	157.9	57.5	228	214.2	78.0	288	270.6	98.5
49	46.0	16.8	109	102.4	37.3	169	158.8	57.8	229	215.2	78.3	289	271.6	98.8
50	47.0	17.1	110	103.4	37.6	170	159.7	58.1	230	216.1	78.7	290	272.5	99.2
51	47.9	17.4	111	104.3	38.0	171	160.7	58.5	231	217.1	79.0	291	273.5	99.5
52	48.9	17.8	112	105.2	38.3	172	161.6	58.8	232	218.0	79.3	292	274.4	99.9
53	49.8	18.1	113	106.2	38.6	173	162.6	59.2	233	218.9	79.7	293	275.3	100.2
54	50.7	18.5	114	107.1	39.0	174	163.5	59.5	234	219.9	80.0	294	276.3	100.6
55	51.7	18.8	115	108.1	39.3	175	164.4	59.9	235	220.8	80.4	295	277.2	100.9
56	52.6	19.2	116	109.0	39.7	176	165.4	60.2	236	221.8	80.7	296	278.1	101.2
57	53.6	19.5	117	109.9	40.0	177	166.3	60.5	237	222.7	81.1	297	279.1	101.6
58	54.5	19.8	118	110.9	40.4	178	167.3	60.9	238	223.6	81.4	298	280.0	101.9
59	55.4	20.2	119	111.8	40.7	179	168.2	61.2	239	224.6	81.7	299	281.0	102.3
60	56.4	20.5	120	112.8	41.0	180	169.1	61.6	240	225.5	82.1	300	281.9	102.6
Dist	Dep.	Lat.	Dist	Dep.	Lat	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.

For 70 Degrees.

TABLE II.

Difference of Latitude and Departure for 21 Degrees.

Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat	Dep.	Dist	Lat.	Dep.
1	00.9	00.4	61	56.9	21.9	121	113.0	43.4	181	169.0	64.9	241	225.0	86.4
2	01.9	00.7	62	57.9	22.2	122	113.9	43.7	182	169.9	65.2	242	225.9	86.7
3	02.8	01.1	63	58.8	22.6	123	114.8	44.1	183	170.8	65.6	243	226.9	87.1
4	03.7	01.4	64	59.7	22.9	124	115.8	44.4	184	171.8	65.9	244	227.8	87.4
5	04.7	01.8	65	60.7	23.3	125	116.7	44.8	185	172.7	66.3	245	228.7	87.8
6	05.6	02.2	66	61.6	23.7	126	117.6	45.2	186	173.6	66.7	246	229.7	88.2
7	06.5	02.5	67	62.5	24.0	127	118.6	45.5	187	174.6	67.0	247	230.6	88.5
8	07.5	02.9	68	63.5	24.4	128	119.5	45.9	188	175.5	67.4	248	231.5	88.9
9	08.4	03.2	69	64.4	24.7	129	120.4	46.2	189	176.4	67.7	249	232.5	89.2
10	09.3	03.6	70	65.4	25.1	130	121.4	46.6	190	177.4	68.1	250	233.4	89·6
11	10.3	03.9	71	66.3	25.4	131	122.3	46.9	191	178.3	68.4	251	234.3	90.0
12	11.2	04.3	72	67.2	25.8	132	123.2	47.3	192	179.2	68.8	252	235.3	90.3
13	12.1	04.7	73	68.2	26.2	133	124.2	47.7	193	180.2	69.2	253	236.2	90.7
14	13.1	05.0	74	69.1	26.5	134	125.1	48.0	194	181.1	69.5	254	237.1	91.0
15	14.0	05.4	75	70.0	26.9	135	126.0	48.4	195	182.0	69.9	255	238.1	91.4
16	14.9	05.7	76	71.0	27.2	136	127.0	48.7	196	183.0	70.2	256	239.0	91.7
17	15.9	06.1	77	71.9	27.6	137	127.9	49.1	197	183.9	70.6	257	239.9	92.1
18	16.8	06.5	78	72.8	28.0	138	128.8	49.5	198	184.8	71.0	258	240.9	92.5
19	17.7	06.8	79	73.8	28.3	139	129.8	49.8	199	185.8	71.3	259	241.8	92.8
20	18.7	07.2	80	74.7	28.7	140	130.7	50.2	200	186.7	71.7	260	242.7	93.2
21	19.6	07.5	81	75.6	29.0	141	131.6	50.5	201	187.6	72.0	261	243.7	93.5
22	20.5	07.9	82	76.6	29.4	142	132.6	50.9	202	188.6	72.4	262	244.6	93.9
23	21.5	08.2	83	77.5	29.7	143	133.5	51.2	203	189.5	72.7	263	245.5	94.3
24	22.4	08.6	84	78.4	30.1	144	134.4	51.6	204	190.4	73.1	264	246.5	94.6
25	23.3	09.0	85	79.4	30.5	145	135.4	52.0	205	191.4	73.5	265	247.4	95.0
26	24.3	09.3	86	80.3	30.8	146	136.3	52.3	206	192.3	73.8	266	248.3	95.3
27	25.2	09.7	87	81.2	31.2	147	137.2	52.7	207	193.3	74.2	267	249.3	95.7
28	26.1	10.0	88	82.2	31.5	148	138.2	53.0	208	194.2	74.5	268	250.2	96.0
29	27.1	10.4	89	83.1	31.9	149	139.1	53.4	209	195.1	74.9	269	251.1	96.4
30	28.0	10.8	90	84.0	32.3	150	140.0	53.8	210	196.1	75.3	270	252.1	96.8
31	28.9	11.1	91	85.0	32.6	151	141.0	54.1	211	197.0	75.6	271	253.0	97.1
32	29.9	11.5	92	85.9	33.0	152	141.9	54.5	212	197.9	76.0	272	253.9	97.5
33	30.8	11.8	93	86.8	33.3	153	142.8	54.8	213	198.9	76.3	273	254.9	97.8
34	31.7	12.2	94	87.8	33.7	154	143.8	55.2	214	199.8	76.7	274	255.8	98.2
35	32.7	12.5	95	88.7	34.0	155	144.7	55.5	215	200.7	77.0	275	256.7	98.6
36	33.6	12.9	96	89.6	34.4	156	145.6	55.9	216	201.7	77.4	276	257.7	98.9
37	34.5	13.3	97	90.6	34.8	157	146.6	56.3	217	202.6	77.8	277	258.6	99.3
38	35.5	13.6	98	91.5	35.1	158	147.5	56.6	218	203.5	78.1	278	259.5	99.6
39	36.4	14.0	99	92.4	35.5	159	148.4	57.0	219	204.5	78.5	279	260.5	100.0
40	37.3	14.3	100	93.4	35.8	160	149.4	57.3	220	205.4	78.8	280	261.4	100.3
41	38.3	14.7	101	94.3	36.2	161	150.3	57.7	221	206.3	79.2	281	262.3	100.7
42	39.2	15.1	102	95.2	36.6	162	151.2	58.1	222	207.3	79.6	282	263.3	101.1
43	40.1	15.4	103	96.2	36.9	163	152.2	58.4	223	208.2	79.9	283	264.2	101.4
44	41.1	15.8	104	97.1	37.3	164	153.1	58.8	224	209.1	80.3	284	265.1	101.8
45	42.0	16.1	105	98.0	37.6	165	154.0	59.1	225	210.1	80.6	285	266.1	102.1
46	42.9	16.5	106	99.0	38.0	166	155.0	59.5	226	211.0	81.0	286	267.0	102.5
47	43.9	16.8	107	99.9	38.3	167	155.9	59.8	227	211.9	81.3	287	267.9	102.9
48	44.8	17.2	108	100.8	38.7	168	156.8	60.2	228	212.9	81.7	288	268.9	103.2
49	45.7	17.6	109	101.8	39.1	169	157.8	60.6	229	213.8	82.1	289	269.8	103.6
50	46.7	17.9	110	102.7	39.4	170	158.7	60.9	230	214.7	82.4	290	270.7	103.9
51	47.6	18.3	111	103.6	39.8	171	159.6	61.3	231	215.7	82.8	291	271.7	104.3
52	48.5	18.6	112	104.6	40.1	172	160.6	61.6	232	216.6	83.1	292	272.6	104.6
53	49.5	19.0	113	105.5	40.5	173	161.5	62.0	233	217.5	83.5	293	273.5	105.0
54	50.4	19.4	114	106.4	40.9	174	162.4	62.4	234	218.5	83.9	294	274.5	105.4
55	51.3	19.7	115	107.4	41.2	175	163.4	62.7	235	219.4	84.2	295	275.4	105.7
56	52.3	20.1	116	108.3	41.6	176	164.3	63.1	236	220.3	84.6	296	276.3	106.1
57	53.2	20.4	117	109.2	41.9	177	165.2	63.4	237	221.3	84.9	297	277.3	106.4
58	54.1	20.8	118	110.2	42.3	178	166.2	63.8	238	222.2	85.3	298	278.2	106.8
59	55.1	21.1	119	111.1	42.6	179	167.1	64.1	239	223.1	85.6	299	279.1	107.2
60	56.0	21.5	220	112.0	43.0	180	168.0	64.5	240	224.1	86.0	300	280.1	107.5
Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.

For 69 Degrees.

TABLE II.

Difference of Latitude and Departure for 22 Degrees.

Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.
1	00.9	00.4	61	56.6	22.9	121	112.2	45.3	181	167.8	67.8	241	223.5	90.3
2	01.9	00.7	62	57.5	23.2	122	113.1	45.7	182	168.7	68.2	242	224.4	90.7
3	02.8	01.1	63	58.4	23.6	123	114.0	46.1	183	169.7	68.6	243	225.3	91.0
4	03.7	01.5	64	59.3	24.0	124	115.0	46.5	184	170.6	68.9	244	226.2	91.4
5	04.6	01.9	65	60.3	24.3	125	115.9	46.8	185	171.5	69.3	245	227.2	91.8
6	05.6	02.2	66	61.2	24.7	126	116.8	47.2	186	172.5	69.7	246	228.1	92.2
7	06.5	02.6	67	62.1	25.1	127	117.8	47.6	187	173.4	70.1	247	229.0	92.5
8	07.4	03.0	68	63.0	25.5	128	118.7	47.9	188	174.3	70.4	248	229.9	92.9
9	08.3	03.4	69	64.0	25.8	129	119.6	48.3	189	175.2	70.8	249	230.9	93.3
10	09.3	03.7	70	64.9	26.2	130	120.5	48.7	190	176.2	71.2	250	231.8	93.7
11	10.2	04.1	71	65.8	26.6	131	121.5	49.1	191	177.1	71.5	251	232.7	94.0
12	11.1	04.5	72	66.8	27.0	132	122.4	49.4	192	178.0	71.9	252	233.7	94.4
13	12.1	04.9	73	67.7	27.3	133	123.3	49.8	193	178.9	72.3	253	234.6	94.8
14	13.0	05.2	74	68.6	27.7	134	124.2	50.2	194	179.9	72.7	254	235.5	95.2
15	13.9	05.6	75	69.5	28.1	135	125.2	50.6	195	180.8	73.0	255	236.4	95.5
16	14.8	06.0	76	70.5	28.5	136	126.1	50.9	196	181.7	73.4	256	237.4	95.9
17	15.8	06.4	77	71.4	28.8	137	127.0	51.3	197	182.7	73.8	257	238.3	96.3
18	16.7	06.7	78	72.3	29.2	138	128.0	51.7	198	183.6	74.2	258	239.2	96.6
19	17.6	07.1	79	73.2	29.6	139	128.9	52.1	199	184.5	74.5	259	240.1	97.0
20	18.5	07.5	80	74.2	30.0	140	129.8	52.4	200	185.4	74.9	260	241.1	97.4
21	19.5	07.9	81	75.1	30.3	141	130.7	52.8	201	186.4	75.3	261	242.0	97.8
22	20.4	08.2	82	76.0	30.7	142	131.7	53.2	202	187.3	75.7	262	242.9	98.1
23	21.3	08.6	83	77.0	31.1	143	132.6	53.6	203	188.2	76.0	263	243.8	98.5
24	22.3	09.0	84	77.9	31.5	144	133.5	53.9	204	189.1	76.4	264	244.8	98.9
25	23.2	09.4	85	78.8	31.8	145	134.4	54.3	205	190.1	76.8	265	245.7	99.3
26	24.1	09.7	86	79.7	32.2	146	135.4	54.7	206	191.0	77.2	266	246.6	99.6
27	25.0	10.1	87	80.7	32.6	147	136.3	55.1	207	191.9	77.5	267	247.6	100.0
28	26.0	10.5	88	81.6	33.0	148	137.2	55.4	208	192.9	77.9	268	248.5	100.4
29	26.9	10.9	89	82.5	33.3	149	138.2	55.8	209	193.8	78.3	269	249.4	100.8
30	27.8	11.2	90	83.4	33.7	150	139.1	56.2	210	194.7	78.7	270	250.3	101.1
31	28.7	11.6	91	84.4	34.1	151	140.0	56.6	211	195.6	79.0	271	251.3	101.5
32	29.7	12.0	92	85.3	34.5	152	140.9	56.9	212	196.6	79.4	272	252.2	101.9
33	30.6	12.4	93	86.2	34.8	153	141.9	57.3	213	197.5	79.8	273	253.1	102.3
34	31.5	12.7	94	87.2	35.2	154	142.8	57.7	214	198.4	80.2	274	254.0	102.6
35	32.5	13.1	95	88.1	35.6	155	143.7	58.1	215	199.3	80.5	275	255.0	103.0
36	33.4	13.5	96	89.0	36.0	156	144.6	58.4	216	200.3	80.9	276	255.9	103.4
37	34.3	13.9	97	89.9	36.3	157	145.6	58.8	217	201.2	81.3	277	256.8	103.8
38	35.2	14.2	98	90.9	36.7	158	146.5	59.2	218	202.1	81.7	278	257.8	104.1
39	36.2	14.6	99	91.8	37.1	159	147.4	59.6	219	203.1	82.0	279	258.7	104.5
40	37.1	15.0	100	92.7	37.5	160	148.3	59.9	220	204.0	82.4	280	259.6	104.9
41	38.0	15.4	101	93.6	37.8	161	149.3	60.3	221	204.9	82.8	281	260.5	105.3
42	38.9	15.7	102	94.6	38.2	162	150.2	60.7	222	205.8	83.2	282	261.5	105.6
43	39.9	16.1	103	95.5	38.6	163	151.1	61.1	223	206.8	83.5	283	262.4	106.0
44	40.8	16.5	104	96.4	39.0	164	152.1	61.4	224	207.7	83.9	284	263.3	106.4
45	41.7	16.9	105	97.4	39.3	165	153.0	61.8	225	208.6	84.3	285	264.2	106.8
46	42.7	17.2	106	98.3	39.7	166	153.9	62.2	226	209.5	84.7	286	265.2	107.1
47	43.6	17.6	107	99.2	40.1	167	154.8	62.6	227	210.5	85.0	287	266.1	107.5
48	44.5	18.0	108	100.1	40.5	168	155.8	62.9	228	211.4	85.4	288	267.0	107.9
49	45.4	18.4	109	101.1	40.8	169	156.7	63.3	229	212.3	85.8	289	368.0	108.3
50	46.4	18.7	110	102.0	41.2	170	157.6	63.7	230	213.3	86.2	290	268.9	108.6
51	47.3	19.1	111	102.9	41.6	171	158.5	64.1	231	214.2	86.5	291	269.8	109.0
52	48.2	19.5	112	103.8	42.0	172	159.5	64.4	232	215.1	86.9	292	270.7	109.4
53	49.1	19.9	113	104.8	42.3	173	160.4	64.8	233	216.0	87.3	293	271.7	109.8
54	50.1	20.2	114	105.7	42.7	174	161.3	65.2	234	217.0	87.7	294	272.6	110.1
55	51.0	20.6	115	106.6	43.1	175	162.3	65.6	235	217.9	88.0	295	273.5	110.5
56	51.9	21.0	116	107.6	43.5	176	163.2	65.9	236	218.8	88.4	296	274.4	110.9
57	52.8	21.4	117	108.5	43.8	177	164.1	66.3	237	219.7	88.8	297	275.4	111.3
58	53.8	21.7	118	109.4	44.2	178	165.0	66.7	238	220.7	89.2	298	276.3	111.6
59	54.7	22.1	119	110.3	44.6	179	166.0	67.1	239	221.6	89.5	299	277.2	112.0
60	55.6	22.5	120	111.2	45.0	180	166.9	67.4	240	222.5	89.9	300	278.2	112.4
Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.

For 68 Degrees.

Difference of Latitude and Departure for 23 Degrees.

Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.
1	00.9	00.4	61	56.2	23.8	121	111.4	47.3	181	166.6	70.7	241	221.8	94.2
2	01.8	00.8	62	57.1	24.2	122	112.3	47.7	182	167.5	71.1	242	222.8	94.5
3	02.8	01.2	63	58.0	24.6	123	113.2	48.1	183	168.5	71.5	243	223.7	94.9
4	03.7	01.6	64	58.9	25.0	124	114.1	48.5	184	169.4	71.9	244	224.6	95.3
5	04.6	02.0	65	59.8	25.4	125	115.1	48.8	185	170.3	72.3	245	225.5	95.7
6	05.5	02.3	66	60.8	25.8	126	116.0	49.2	186	171.2	72.7	246	226.4	96.1
7	06.4	02·7	67	61.7	26.2	127	116.9	49.6	187	172.1	73.1	247	227.4	96.5
8	07.4	03.1	68	62.6	26.6	128	117.8	50.0	188	173.1	73.5	248	228.3	96.9
9	08.3	03.5	69	63.5	27.0	129	118.7	50.4	189	174.0	73.8	249	229.2	97.3
10	09.2	03.9	70	64.4	27.4	130	119.7	50.8	190	174.9	74.2	250	230.1	97.7
11	10.1	04.3	71	65.4	27.7	131	120.6	51.2	191	175.8	74.6	251	231.0	98.1
12	11.0	04.7	72	66.3	28.1	132	121.5	51.6	192	176.7	75.0	252	232.0	98.5
13	12.0	05.1	73	67.2	28.5	133	122.4	52.0	193	177.7	75.4	253	232.9	98.9
14	12.9	05.5	74	68.1	28.9	134	123.3	52.4	194	178.6	75.8	254	233.8	99.2
15	13.8	05.9	75	69.0	29.3	135	124.3	52.7	195	179.5	76.2	255	234.7	99.6
16	14.7	06.3	76	70.0	29.7	136	125.2	53.1	196	180.4	76.6	256	235.6	100.0
17	15.6	06.6	77	70.9	30.1	137	126.1	53.5	197	181.3	77.0	257	236.6	100.4
18	16.6	07.0	78	71.8	30.5	138	127.0	53.9	198	182.3	77.4	258	237.5	100.8
19	17.5	07.4	79	72.7	30.9	139	128.0	54.3	199	183.2	77.8	259	238.4	101.2
20	18.4	07.8	80	73.6	31.3	140	128.9	54.7	200	184.1	78.1	260	239.3	101.6
21	19.3	08.2	81	74.6	31.6	141	129.8	55.1	201	185.0	78.5	261	240.3	102.0
22	20.3	08.6	82	75.5	32.0	142	130.7	55.5	202	185.9	78.9	262	241.2	102.4
23	21.2	09.0	83	76.4	32.4	143	131.6	55.9	203	186.9	79.3	263	242.1	102.8
24	22.1	09.4	84	77.3	32.8	144	132.6	56.3	204	187.8	79.7	264	243.0	103.2
25	23.0	09.8	85	78.2	33.2	145	133.5	56.7	205	188.7	80.1	265	243.9	103.5
26	23.9	10.2	86	79.2	33.6	146	134.4	57.0	206	189.6	80.5	266	244.9	103.9
27	24.9	10.5	87	80.1	34.0	147	135.3	57.4	207	190.5	80.9	267	245.8	104.3
28	25.8	10.9	88	81.0	34.4	148	136.2	57.8	208	191.5	81.3	268	246.7	104.7
29	26.7	11.3	89	81.9	34.8	149	137.2	58.2	209	192.4	81.7	269	247.6	105.1
30	27.6	11.7	90	82.8	35.2	150	138.1	58.6	210	193.3	82.1	270	248.5	105.5
31	28.5	12.1	91	83.8	35.6	151	139.0	59.0	211	194.2	82.4	271	249.5	105.9
32	29.5	12.5	92	84.7	35.9	152	139.9	59.4	212	195.1	82.8	272	250.4	106.3
33	30.4	12.9	93	85.6	36.3	153	140.8	59.8	213	196.1	83.2	273	251.3	106.7
34	31.3	13.3	94	86.5	36.7	154	141.8	60.2	214	197.0	83.6	274	252.2	107.1
35	32.2	13.7	95	87.4	37.1	155	142.7	60.6	215	197.9	84.0	275	253.1	107.5
36	33.1	14.1	96	88.4	37.5	156	143.6	61.0	216	198.8	84.4	276	254.1	107.8
37	34.1	14.5	97	89.3	37.9	157	144.5	61.3	217	199.7	84.8	277	255.0	108.2
38	35.0	14.8	98	90.2	38.3	158	145.4	61.7	218	200.7	85.2	278	255.9	108.6
39	35.9	15.2	99	91.1	38.7	159	146.4	62.1	219	201.6	85.6	279	256.8	109.0
40	36.8	15.6	100	92.1	39.1	160	147.3	62.5	220	202.5	86.0	280	257.7	109.4
41	37.7	16.0	101	93.0	39.5	161	148.2	62.9	221	203.4	86.4	281	258.7	109.8
42	38.7	16.4	102	93.9	39.9	162	149.1	63.3	222	204.4	86.7	282	259.6	110.2
43	39.6	16.8	103	94.8	40.2	163	150.0	63.7	223	205.3	87.1	283	260.5	110.6
44	40.5	17.2	104	95.7	40.6	164	151.0	64.1	224	206.2	87.5	284	261.4	111.0
45	41.4	17.6	105	96.7	41.0	165	151.9	64.5	225	207.1	87.9	285	262.3	111.4
46	42.3	18.0	106	97.6	41.4	166	152.8	64.9	226	208.0	88.3	286	263.3	111.7
47	43.3	18.4	107	98.5	41.8	167	153.7	65.3	227	209.0	88.7	287	264.2	112.1
48	44.2	18.8	108	99.4	42.2	168	154.6	65.6	228	209.9	89.1	288	265.1	112.5
49	45.1	19.1	109	100.3	42.6	169	155.6	66.0	229	210.8	89.5	289	266.0	112.9
50	46.0	19.5	110	101.3	43.0	170	156.5	66.4	230	211.7	89.9	290	266.9	113.3
51	46.9	19.9	111	102.2	43.4	171	157.4	66.8	231	212.6	90.3	291	267.9	113.7
52	47.9	20.3	112	103.1	43.8	172	158.3	67.2	232	213.6	90.6	292	268.8	114.1
53	48.8	20.7	113	104.0	44.2	173	159.2	67.6	233	214.5	91.0	293	269.7	114.5
54	49.7	21.1	114	104.9	44.5	174	160.2	68.0	234	215.4	91.4	294	270.6	114.9
55	50.6	21.5	115	105.9	44.9	175	161.1	68.4	235	216.3	91.8	295	271.5	115.3
56	51.5	21.9	116	106.8	45.3	176	162.0	68.8	236	217.2	92.2	296	272.5	115.7
57	52.5	22.3	117	107.7	45.7	177	162.9	69.2	237	218.2	92.6	297	273.4	116.0
58	53.4	22.7	118	108.6	46.1	178	163.8	69.5	238	219.1	93.0	298	274.3	116.4
59	54.3	23.1	119	109.5	46.5	179	164.8	69.9	239	220.0	93.4	299	275.2	116.8
60	55.2	23.4	120	110.5	46.9	180	165.7	70.3	240	220.9	93.8	300	276.2	117.2
Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.

For 67 Degrees.

TABLE II.

Difference of Latitude and Departure for 24 Degrees.

Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.
1	00.9	00.4	61	55.7	24.8	121	110.5	49.2	181	165.4	73.6	241	220.2
2	01.8	00.8	62	56.6	25.2	122	111.5	49.6	182	166.3	74.0	242	221.1
3	02.7	01.2	63	57.6	25.6	123	112.4	50.0	183	167.2	74.4	243	222.0
4	03.7	01.6	64	58.5	26.0	124	113.3	50.4	184	168.1	74.8	244	222.9
5	04.6	02.0	65	59.4	26.4	125	114.2	50.8	185	169.0	75.2	245	223.8
6	05.5	02.4	66	60.3	26.8	126	115.1	51.2	186	169.9	75.7	246	224.7
7	06.4	02.8	67	61.2	27.3	127	116.0	51.7	187	170.8	76.1	247	225.6
8	07.3	03.3	68	62.1	27.7	128	116.9	52.1	188	171.7	76.5	248	226.6
9	08.2	03.7	69	63.0	28.1	129	117.8	52.5	189	172.7	76.9	249	227.5
10	09.1	04.1	70	63.9	28.5	130	118.8	52.9	190	173.6	77.3	250	228.4
11	10.0	04.5	71	64.9	28.9	131	119.7	53.3	191	174.5	77.7	251	229.3
12	11.0	04.9	72	65.8	29.3	132	120.6	53.7	192	175.4	78.1	252	230.2
13	11.9	05.3	73	66.7	29.7	133	121.5	54.1	193	176.3	78.5	253	231.1
14	12.8	05.7	74	67.6	30.1	134	122.4	54.5	194	177.2	78.9	254	232.0
15	13.7	06.1	75	68.5	30.5	135	123.3	54.9	195	178.1	79.3	255	233.0
16	14.6	06.5	76	69.4	30.9	136	124.2	55.3	196	179.1	79.7	256	222.9
17	15.5	06.9	77	70.3	31.3	137	125.2	55.7	197	180.0	80.1	257	234.8
18	16.4	07.3	78	71.3	31.7	138	126.1	56.1	198	180.9	80.5	258	235.7
19	17.4	07.7	79	72.2	32.1	139	127.0	56.5	199	181.8	80.9	259	236.6
20	18.3	08.1	80	73.1	32.5	140	127.9	56.9	200	182.7	81.3	260	237.5
21	19.2	08.5	81	74.0	32.9	141	128.8	57.3	201	183.6	81.8	261	238.4
22	20.1	08.9	82	74.9	33.4	142	129.7	57.8	202	184.5	82.2	262	239.3
23	21.0	09.4	83	75.8	33.8	143	130.6	58.2	203	185.4	82.6	263	240.3
24	21.9	09.8	84	76.7	34.2	144	131.6	58.6	204	186.4	83.0	264	241.2
25	22.8	10.2	85	77.7	34.6	145	132.5	59.0	205	187.3	83.4	265	242.1
26	23.8	10.6	86	78.6	35.0	146	133.4	59.4	206	188.2	83.8	266	243.0
27	24.7	11.0	87	79.5	35.4	147	134·3	59.8	207	189.1	84.2	267	243.9
28	25.6	11.4	88	80.4	35.8	148	135.2	60.2	208	190.0	84.6	268	244.8
29	26.5	11.8	89	81.3	36.2	149	136.1	60.6	209	190.9	85.0	269	245.7
30	27.4	12.2	90	82.2	36.6	150	137.0	61.0	210	191.8	85.4	270	246.7
31	28.3	12.6	91	83.1	37.0	151	137.9	61.4	211	192.8	85.8	271	247.6
32	29.2	13.0	92	84.0	37.4	152	138.9	61.8	212	193.7	86.2	272	248.5
33	30.1	13.4	93	85.0	37.8	153	139.8	62.2	213	194.6	86.6	273	249.4
34	31.1	13.8	94	85.9	38.2	154	140.7	62.6	214	195.5	87.0	274	250.3
35	32.0	14.2	95	86.8	38.6	155	141.6	63.0	215	196.4	87.4	275	251.2
36	32·9	14.6	96	87.7	39.0	156	142.5	63.5	216	197.3	87.9	276	252.1
37	33.8	15.0	97	88.6	39.5	157	143.4	63.9	217	198.2	88.3	277	253.1
38	34.7	15.5	98	89.5	39.9	158	144.3	64.3	218	199.2	88.7	278	254.0
39	35.6	15.9	99	90.4	40.3	159	145.3	64.7	219	200.1	89.1	279	254.9
40	36.5	16.3	100	91.4	40.7	160	146.2	65.1	220	201.0	89.5	280	255.8
41	37.5	16.7	101	92.3	41.1	161	147.1	65.5	221	201.9	89.9	281	256.7
42	38.4	17.1	102	93.2	41.5	162	148.0	65.9	222	202.8	90.3	282	257.6
43	39.3	17.5	103	94.1	41.9	163	148.9	66.3	223	203.7	90.7	283	258.5
44	40.2	17.9	104	95.0	42.3	164	149.8	66.7	224	204.6	91.1	284	259.4
45	41.1	18.3	105	95.9	42.7	165	150.7	67.1	225	205.5	91.5	285	260.4
46	42.0	18.7	106	96.8	43.1	166	151.6	67.5	226	206.5	91.9	286	261.3
47	42.9	19.1	107	97.7	43.5	167	152.6	67.9	227	207.4	92.3	287	262.2
48	43.9	19.5	108	98.7	43.9	168	153.5	68.3	228	208.3	92.7	288	263.1
49	44.8	19.9	109	99.6	44.3	169	154.4	68.7	229	209.2	93.1	289	264.0
50	45.7	20.3	110	100.5	44.7	170	155.3	69.1	230	210.1	93.5	290	264.9
51	46.6	20.7	111	101.4	45.1	171	156.2	69.6	231	211.0	94.0	291	265.8
52	47.5	21.2	112	102.3	45.6	172	157.1	70.0	232	211.9	94.4	292	266.8
53	48.4	21.6	113	103.2	46.0	173	158.0	70.4	233	212.9	94.8	293	267.7
54	49.3	22.0	114	104.1	46.4	174	159.0	70.8	234	213.8	95.2	294	268.6
55	50.2	22.4	115	105.1	46.8	175	157.9	71.2	235	214.7	95.6	295	269.5
56	51.2	22.8	116	106.0	47.2	176	160.8	71.6	236	215.6	96.0	296	270.4
57	52.1	23.2	117	106.9	47.6	177	161.7	72.0	237	216.5	96.4	297	271.3
58	53.0	23.6	118	107.8	48.0	178	162.6	72.4	238	217.4	96.8	298	272.2
59	53.9	24.0	119	108.7	48.4	179	163.5	72.8	239	218.3	97.2	299	273.2
60	54.8	24.4	120	109.6	48.8	180	164.4	73.2	240	219.3	97.6	300	274.1
Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.

For 66 Degrees.

TABLE II.

Difference of Latitude and Departure for 25 Degrees.

Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.
1	00.9	00.4	61	55.3	25.8	121	109.7	51.1	181	164.0	76.5	241	218.4	101.9
2	01.8	00.8	62	56.2	26.2	122	110.6	51.6	182	164.9	76.9	242	219.3	102.3
3	02.7	01.3	63	57.1	26.6	123	111.5	52.0	183	165.9	77.3	243	220.2	102.7
4	03.6	01.7	64	58.0	27.0	124	112.4	52.4	184	166.8	77.8	244	221.1	103.1
5	04.5	02.1	65	58.9	27.5	125	113.3	52.8	185	167.7	78.2	245	222.0	103.5
6	05.4	02.5	66	59.8	27.9	126	114.2	53.2	186	168.6	78.6	246	223.0	104.0
7	06.3	03.0	67	60.7	28.3	127	115.1	53.7	187	169.5	79.0	247	223.9	104.4
8	07.3	03.4	68	61.6	28.7	128	116.0	54.1	188	170.4	79.5	248	224.8	104.8
9	08.2	03.8	69	62.5	29.2	129	116.9	54.5	189	171.3	79.9	249	225.7	105.2
10	09.1	04.2	70	63.4	29.6	130	117.8	54.9	190	172.2	80.3	250	226.6	105.7
11	10.0	04.6	71	64.3	30.0	131	118.7	55.4	191	173.1	80.7	251	227.5	106.1
12	10.9	05.1	72	65.3	30.4	132	119.6	55.8	192	174.0	81.1	252	228.4	106.5
13	11.8	05.5	73	66.2	30.9	133	120.5	56.2	193	174.9	81.6	253	229.3	106.9
14	12.7	05.9	74	67.1	31.3	134	121.4	56.6	194	175.8	82.0	254	230.2	107.3
15	13.6	06.3	75	68.0	31.7	135	122.4	57.1	195	176.7	82.4	255	231.1	107.8
16	14.5	06.8	76	68.9	32.1	136	123.3	57.5	196	177.6	82.8	256	232.0	108.2
17	15.4	07.2	77	69.8	32.5	137	124.2	57.9	197	178.5	83.3	257	232.9	108.6
18	16.3	07.6	78	70.7	33.0	138	125.1	58.3	198	179.4	83.7	258	233.8	109.0
19	17.2	08.0	79	71.6	33.4	139	126.0	58.7	199	180.4	84.1	259	234.7	109.5
20	18.1	08.5	80	72.5	33.8	140	126.9	59.2	200	181.3	84.5	260	235.6	109.9
21	19.0	08.9	81	73.4	34.2	141	127.8	59.6	201	182.2	84.9	261	236.5	110.3
22	19.9	09.3	82	74.3	34.7	142	128.7	60.0	202	183.1	85.4	262	237.5	110.7
23	20.8	09.7	83	75.2	35.1	143	129.6	60.4	203	184.0	85.8	263	238.4	111.1
24	21 8	10.1	84	76.1	35.5	144	130.5	60.9	204	184.9	86.2	264	239.3	111.6
25	22.7	10.6	85	77.0	35.9	145	131.4	61.3	205	185.8	86.6	265	240.2	112.0
26	23.6	11.0	86	77.9	36.3	146	132.3	61.7	206	186.7	87.1	266	241.1	112.4
27	24.5	11.4	87	78.8	36.8	147	133.2	62.1	207	187.6	87.5	267	242.0	112.8
28	25.4	11.8	88	79.8	37.2	148	134.1	62.5	208	188.5	87.9	268	242.9	113.3
29	26.3	12.3	89	80.7	37.6	149	135.0	63.0	209	189.4	88.3	269	243.8	113.7
30	27.2	12.7	90	81.6	38.0	150	135.9	63.4	210	190.3	88.7	270	244.7	114.1
31	28.1	13.1	91	82.5	38.5	151	136.9	63.8	211	191.2	89.2	271	245.6	114.5
32	29.0	13.5	92	83.4	38.9	152	137.8	64.2	212	192.1	89.6	272	246.5	115.0
33	29.9	13.9	93	84.3	39.3	153	138.7	64.7	213	193.0	90.0	273	247.4	115.4
34	30.8	14.4	94	85.2	39.7	154	139.6	65.1	214	193.9	90.4	274	248.3	115.8
35	31.7	14.8	95	86.1	40.1	155	140.5	65.5	215	194.9	90.9	275	249.2	116.2
36	32.6	15.2	96	87.0	40.6	156	141.4	65.9	216	195.8	91.3	276	250.1	116.6
37	33.5	15.6	97	87.9	41.0	157	142.3	66.4	217	196.7	91.7	277	251.0	117.1
38	34.4	16.1	98	88.8	41.4	158	143.2	66.8	218	197.6	92.1	278	252.0	117.5
39	35.3	16.5	99	89.7	41.8	159	144.1	67.2	219	198.5	92.6	279	252.9	117.9
40	36.3	16.9	100	90.6	42.3	160	145.0	67.6	220	199.4	93.0	280	253.8	118.3
41	37.2	17.3	101	91.5	42.7	161	145.9	68.0	221	200.3	93.4	281	254.7	118.8
42	38.1	17.7	102	92.4	43.1	162	146.8	68.5	222	201.2	93.8	282	255.6	119.2
43	39.0	18.2	103	93.3	43.5	163	147.7	68.9	223	202.1	94.2	283	256.5	119.6
44	39.9	18.6	104	94.3	44.0	164	148.6	69.3	224	203.0	94.7	284	257.4	120.0
45	40.8	19.0	105	95.2	44.4	165	149.5	69.7	225	203.9	95.1	285	258.3	120.4
46	41.7	19.4	106	96.1	44.8	166	150.4	70.2	226	204.8	95.5	286	259.2	120.9
47	42.6	19.9	107	97.0	45.2	167	151.4	70.6	227	205.7	95.9	287	260.1	121.3
48	43.5	20.3	108	97.9	45.6	168	152.3	71.0	228	206.6	96.4	288	261.0	121.7
49	44.4	20.7	109	98.8	46.1	169	153.2	71.4	229	207.5	96.8	289	261.9	122.1
50	45.3	21.1	110	99.7	46.5	170	154.1	71.8	230	208.5	97.2	290	262.8	122.6
51	46.2	21.6	111	100.6	46.9	171	155.0	72.3	231	209.4	97.6	291	263.7	123.0
52	47.1	22.0	112	101.5	47.3	172	155.9	72.7	232	210.3	98.0	292	264.6	123.4
53	48.0	22.4	113	102.4	47.8	173	156.8	73.1	233	211.2	98.5	293	265.5	123.8
54	48.9	22.8	114	103.3	48.2	174	157.7	73.5	234	212.1	98.9	294	266.5	124.2
55	49.8	23.2	115	104.2	48.6	175	158.6	74.0	235	213.0	99.3	295	267.4	124.7
56	50.8	23.7	116	105.1	49.0	176	159.5	74.4	236	213.9	99.7	296	268.3	125.1
57	51.7	24.1	117	106.0	49.4	177	160.4	74.8	237	214.8	100.2	297	269.2	125.5
58	52.6	24.5	118	106.9	49.9	178	161.3	75.2	238	215.7	100.6	298	270.1	125.9
59	53.5	24.9	119	107·9	50.3	179	162.2	75.6	239	216.6	101.0	299	271.0	126.4
60	54.4	25.4	120	108.8	50.7	180	163.1	76.1	240	217.5	101.4	300	271.9	126.8
Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.

For 65 Degrees.

TABLE II.

Difference of Latitude and Departure for 26 Degrees.

Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.
1	00.9	00.4	61	54.8	26.7	121	108.8	53.0	181	162.7	79.3	241	216.6
2	01.8	00.9	62	55.7	27.2	122	109.7	53.5	182	163.6	79.8	242	217.5
3	02.7	01.3	63	56.6	27.6	123	110.6	53.9	183	164.5	80.2	243	218.4
4	03.6	01.8	64	57.5	28.1	124	111.5	54.4	184	165.4	80.7	244	219.3
5	04.5	02.2	65	58.4	28.5	125	112.3	54.8	185	166.3	81.1	245	220.2
6	05.4	02.6	66	59.3	28.9	126	113.2	55.2	186	167.2	81.5	246	221.1
7	06.3	03.1	67	60.2	29.4	127	114.1	55.7	187	168.1	82.0	247	222.0
8	07.2	03.5	68	61.1	29.8	128	115.0	56.1	188	169.0	82.4	248	222.9
9	08.1	03.9	69	62.0	30.2	129	115.9	56.5	189	169.9	82.9	249	223.8
10	09.0	04.4	70	62.9	30.7	130	116.8	57.0	190	170.8	83.3	250	224.7
11	09.9	04.8	71	63.8	31.1	131	117.7	57.4	191	171.7	83.7	251	225.6
12	10.8	05.3	72	64.7	31.6	132	118.6	57.9	192	172.6	84.2	252	226.5
13	11.7	05.7	73	65.6	32.0	133	119.5	58.3	193	173.5	84.6	253	227.4
14	12.6	06.1	74	66.5	32.4	134	120.4	58.7	194	174.4	85.0	254	228.3
15	13.5	06.6	75	67.4	32.9	135	121.3	59.2	195	175.3	85.5	255	229.2
16	14.4	07.0	76	68.3	33.3	136	122.2	59.6	196	176.2	85.9	256	230.1
17	15.3	07.5	77	69.2	33.8	137	123.1	60.1	197	177.1	86.4	257	231.0
18	16.2	07.9	78	70.1	34.2	138	124.0	60.5	198	178.0	86.8	258	231.9
19	17.1	08.3	79	71.0	34.6	139	124.9	60.9	199	178.9	87.2	259	232.8
20	18.0	08.8	80	71.9	35.1	140	125.8	61.4	200	179.8	87.7	260	233.7
21	18.9	09.2	81	72.8	35.5	141	126.7	61.8	201	180.7	88.1	261	234.6
22	19.8	09.6	82	73.7	35.9	142	127.6	62.2	202	181.6	88.6	262	235.5
23	20.7	10.1	83	74.6	36.4	143	128.5	62.7	203	182.5	89.0	263	236.4
24	21.6	10.5	84	75.5	36.8	144	129.4	63.1	204	183.4	89.4	264	237.3
25	22.5	11.0	85	76.4	37.3	145	130.3	63.6	205	184.3	89.9	265	238.2
26	23.4	11.4	86	77.3	37.7	146	131.2	64.0	206	185.2	90.3	266	239.1
27	24.3	11.8	87	78.2	38.1	147	132.1	64.4	207	186.1	90.7	267	240.0
28	25.2	12.3	88	79.1	38.6	148	133.0	64.9	208	186.9	91.2	268	240.9
29	26.1	12.7	89	80.0	39.0	149	133.9	65.3	209	187.8	91.6	269	241.8
30	27.0	13.2	90	80.9	39.5	150	134.8	65.8	210	188.7	92.1	270	242.7
31	27.9	13.6	91	81.8	39.9	151	135.7	66.2	211	189.6	92.5	271	243.6
32	28.8	14.0	92	82.7	40.3	152	136.6	66.6	212	190.5	92.9	272	244.5
33	29.7	14.5	93	83.6	40.8	153	137.5	67.1	213	191.4	93.4	273	245.4
34	30.6	14.9	94	84.5	41.2	154	138.4	67.5	214	192.3	93.8	274	246.3
35	31.5	15.3	95	85.4	41.6	155	139.3	67.9	215	193.2	94.2	275	247.2
36	32.4	15.8	96	86.3	42.1	156	140.2	68.4	216	194.1	94.7	276	248.1
37	33.3	16.2	97	87.2	42.5	157	141.1	68.8	217	195.0	95.1	277	249.0
38	34.2	16.7	98	88.1	43.0	158	142.0	69.3	218	195.9	95.6	278	249.9
39	35.1	17.1	99	89.0	43.4	159	132.9	69.7	219	196.8	96.0	279	250.8
40	36.0	17.5	100	89.9	43.8	160	143.8	70.1	220	197.7	96.4	280	251.7
41	36.9	18.0	101	90.8	44.3	161	144.7	70.6	221	198.6	96.9	281	252.6
42	37.7	18.4	102	91.7	44.7	162	145.6	71.0	222	199.5	97.3	282	253.5
43	38.6	18.8	103	92.6	45.2	163	146.5	71.5	223	200.4	97.8	283	254.4
44	39.5	19.3	104	93.5	45.6	164	147.4	71.9	224	201.3	98.2	284	255.3
45	40.4	19.7	105	94.4	46.0	165	148.3	72.3	225	202.2	98.6	285	256.2
46	41.3	20.2	106	95.3	46.5	166	149.2	72.8	226	203.1	99.1	286	257.1
47	42.2	20.6	107	96.2	46.9	167	150.1	73.2	227	204.0	99.5	287	258.0
48	43.1	21.0	108	97.1	47.3	168	151.0	73.6	228	204.9	99.9	288	258.9
49	44.0	21.5	109	98.0	47.8	169	151.9	74.1	229	205.8	100.4	289	259.8
50	44.9	21.9	110	98.9	48.2	170	152.8	74.5	230	206.7	100.8	290	260.7
51	45.8	22.4	111	99.8	48.7	171	153.7	75.0	231	207.6	101.3	291	261.5
52	46.7	22.8	112	100.7	49.1	172	154.6	75.4	232	208.5	101.7	292	262.4
53	47.6	23.2	113	101.6	49.5	173	155.5	75.8	233	209.4	102.1	293	263.3
54	48.5	23.7	114	102.5	50.0	174	156.4	76.3	234	210.3	102.6	294	264.2
55	49.4	24.1	115	103.4	50.4	175	157.3	76.7	235	211.2	103.0	295	265.1
56	50.3	24.5	116	104.3	50.9	176	158.2	77.2	236	212.1	103.5	296	266.0
57	51.2	25.0	117	105.2	51.3	177	159.1	77.6	237	213.0	103.9	297	266.9
58	52.1	25.4	118	106.1	51.7	178	160.0	78.0	238	213.9	104.3	298	267.8
59	53.0	25.9	119	107.0	52.2	179	160.9	78.5	239	214.8	104.8	299	268.7
60	53.9	26.3	120	107.9	52.6	180	161.8	78.9	240	215.7	105.2	300	269.6
Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.

For 64 Degrees.

Difference of Latitude and Departure for 27 Degrees.

Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.
1	00.9	00.5	61	54.4	27.7	121	107.8	54.9	181	161.3	82.2	241	214.7	109.4
2	01.8	00.9	62	55.2	28.1	122	108.7	55.4	182	162.2	82.6	242	215.6	109.9
3	02.7	01.4	63	56.1	28.6	123	109.6	55.8	183	163.1	83.1	243	216.5	110.3
4	03.6	01.8	64	57.0	29.1	124	110.5	56.3	184	163·9	83.5	244	217.4	110.8
5	04.5	02.3	65	57.9	29.5	125	111.4	56.7	185	164.8	84.0	245	218.3	111.2
6	05.3	02.7	66	58.8	30.0	126	112.3	57.2	186	165.7	84.4	246	219.2	111.7
7	06.2	03.2	67	59.7	30.4	127	113.2	57.7	187	166.6	84.9	247	220.1	112.1
8	07.1	03.6	68	60.6	30.9	128	114.0	58.1	188	167.5	85.4	248	221.0	112.6
9	08.0	04.1	69	61.5	31.3	129	114.9	58.6	189	168.4	85.8	249	221.9	113.0
10	08.9	04.5	70	62.4	31.8	130	115.8	59.0	190	169.3	86.3	250	222.8	113.5
11	09.8	05.0	71	63.3	32.2	131	116.7	59.5	191	170.2	86.7	251	223.6	114.0
12	10.7	05.4	72	64.2	32.7	132	117.6	59.9	192	171.1	87.2	252	224.5	114.4
13	11.6	05.9	73	65.0	33.1	133	118.5	60.4	193	172.0	87.6	253	225.4	114.9
14	12.5	06.4	74	65.9	33.6	134	119.4	60.8	194	172.9	88.1	254	226.3	115.3
15	13.4	06.8	75	66.8	34.0	135	120.3	61.3	195	173.7	88.5	255	227.2	115.8
16	14.3	07.3	76	67.7	34.5	136	121.2	61.7	196	174.6	89.0	256	228.1	116.2
17	15.1	07.7	77	68.6	35.0	137	122.1	62.2	197	175.5	89.4	257	229.0	116.7
18	16.0	08.2	78	69.5	35.4	138	123.0	62.7	198	176.4	89.9	258	229.9	117.1
19	16.9	08.6	79	70.4	35.9	139	123.8	63.1	199	177.3	90.3	259	230.8	117.6
20	17.8	09.1	80	71.3	36.3	140	124.7	63.6	200	178.2	90.8	260	231.7	118.0
21	18.7	09.5	81	72.2	36.8	141	125.6	64.0	201	179.1	91.3	261	232.6	118.5
22	19.6	10.0	82	73.1	37.2	142	126.5	64.5	202	180.0	91.7	262	233.4	118.9
23	20.5	10.4	83	74.0	37.7	143	127.4	64.9	203	180.9	92.2	263	234.3	119.4
24	21.4	10.9	84	74.8	38.1	144	128.3	65.4	204	181.8	92.6	264	235.2	119.9
25	22.3	11.3	85	75.7	38.6	145	129.2	65.8	205	182.7	93.1	265	236.1	120.3
26	23.2	11.8	86	76.6	39.0	146	130.1	66.3	206	183.5	93.5	266	237.0	120.8
27	24.1	12.3	87	77.5	39.5	147	131.0	66.7	207	184.4	94.0	267	237.9	121.2
28	24.9	12.7	88	78.4	40.0	148	131.9	67.2	208	185.3	94.4	268	238.8	121.7
29	25.8	13.2	89	79.3	40.4	149	132.8	67.6	209	186.2	94.9	269	239.7	122.1
30	26.7	13.6	90	80.2	40.9	150	133.7	68.1	210	187.1	95.3	270	240.6	122.6
31	27.6	14.1	91	81.1	41.3	151	134.5	68.6	211	188.0	95.8	271	241.5	123.0
32	28.5	14.5	92	82.0	41.8	152	135.4	69.0	212	188.9	96.2	272	242.4	123.5
33	29.4	15.0	93	82.9	42.2	153	136.3	69.5	213	189.8	96.7	273	243.2	123.9
34	30.3	15.4	94	83.8	42.7	154	137.2	69.9	214	190.7	97.2	274	244.1	124.4
35	31.2	15.9	95	84.6	43.1	155	138.1	70.4	215	191.6	97.6	275	245.0	124.8
36	32.1	16.3	96	85.5	43.6	156	139.0	70.8	216	192.5	98.1	276	245.9	125.3
37	33.0	16.8	97	86.4	44.0	157	139.9	71.3	217	193.3	98.5	277	246.8	125.8
38	33.9	17.3	98	87.3	44.5	158	140.8	71.7	218	194.2	99.0	278	247.7	126.2
39	34.7	17.7	99	88.2	44.9	159	141.7	72.2	219	195.1	99.4	279	248.6	126.7
40	35.6	18.2	100	89.1	45.4	160	142.6	72.6	220	196.0	99.9	280	249.5	127.1
41	36.5	18.6	101	90.0	45.9	161	143.5	73.1	221	196.9	100.3	281	250.4	127.6
42	37.4	19.1	102	90.9	46.3	162	144.3	73.5	222	197.8	100.8	282	251.3	128.0
43	38.3	19.5	103	91.8	46.8	163	145.2	74.0	223	198.7	101.2	283	252.2	128.5
44	39.2	20.0	104	92.7	47.2	164	146.1	74.5	224	199.6	101.7	284	253.0	128.9
45	40.1	20.4	105	93.6	47.7	165	147.0	74.9	225	200.5	102.1	285	253.9	129.4
46	41.0	20.9	106	94.4	48.1	166	147.9	75.4	226	201.4	102.6	286	254.8	129.8
47	41.9	21.3	107	95.3	48.6	167	148.8	75.8	227	202.3	103.1	287	255.7	130.3
48	42.8	21.8	108	96.2	49.0	168	149.7	76.3	228	203.1	103.5	288	256.6	130.7
49	43.7	22.2	109	97.1	49.5	169	150.6	76.7	229	204.0	104.0	289	257.5	131.2
50	44.6	22.7	110	98.0	49.9	170	151.5	77.2	230	204.9	104.4	290	258.4	131.7
51	45.4	23.2	111	98.9	50.4	171	152.4	77.6	231	205.8	104.9	291	259.3	132.1
52	46.3	23.6	112	99.8	50.8	172	153.3	78.1	232	206.7	105.3	292	260.2	132.6
53	47.2	24.1	113	100.7	51.3	173	154.1	78.5	233	207.6	105.8	293	261.1	133.0
54	48.1	24.5	114	101.6	51.8	174	155.0	79.0	234	208.5	106.2	294	262.0	133.5
55	49.0	25.0	115	102.5	52.2	175	155.9	79.4	235	209.4	106.7	295	262.8	133.9
56	49.9	25.4	116	103.4	52.7	176	156.8	79.9	236	210.3	107.1	296	263.7	134.4
57	50.8	25.9	117	104.2	53.1	177	157.7	80.4	237	211.2	107.6	297	264.6	131.8
58	51.7	26.3	118	105.1	53.6	178	158.6	80.8	238	212.1	108.0	298	265.5	135.3
59	52.6	26.8	119	106.0	54.0	179	159.5	81.3	239	213.0	108.5	299	266.4	135.7
60	53.5	27.2	120	106.9	54.5	180	160.4	81.7	240	213.8	109.0	300	267.3	136.2
Dist	Dep.	Lat.	Dist	Dep	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.

For 63 Degrees.

TABLE II.

Difference of Latitude and Departure for 28 Degrees.

Dist	Lat.	Dep	Dist	Lat.	Dep	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.
1	00.9	00.5	61	53.9	28.6	121	106.8	56.8	181	159.8	85.0	241	212.8	113.1
2	01.8	00.9	62	54.7	29.1	122	107.7	57.3	182	160.7	85.4	242	213.7	113.6
3	02.6	01.4	63	55.6	29.6	123	108.6	57.7	183	161.6	85.9	243	214.6	114.1
4	03.5	01.9	64	56.5	30.0	124	109.5	58.2	184	162.5	86.4	244	215.4	114.6
5	04.4	02.3	65	57.4	30.5	125	110.4	58.7	185	163.3	86.9	245	216.3	115.0
6	05.3	02.8	66	58.3	31.0	126	111.3	59.2	186	164.2	87.3	246	217.2	115.5
7	06.2	03.3	67	59.2	31.5	127	112.1	59.6	187	165.1	87.8	247	218.1	116.0
8	07.1	03.8	68	60.0	31.9	128	113.0	60.1	188	166.0	88.3	248	219.0	116.4
9	07.9	04.2	69	60.9	32.4	129	113.9	60.6	189	166.9	88.7	249	219.9	116.9
10	08.8	04.7	70	61.8	32.9	130	114.8	61.0	190	167.8	89.2	250	220.7	117.4
11	09.7	05.2	71	62.7	33.3	131	115.7	61.5	191	168.6	89.7	251	221.6	117.9
12	10.6	05.6	72	63.6	33.8	132	116.5	62.0	192	169.5	90.1	252	222.5	118.3
13	11.5	06.1	73	64.5	34.3	133	117.4	62.4	193	170.4	90.6	253	223.4	118.8
14	12.4	06.6	74	65.3	34.7	134	118.3	62.9	194	171.3	91.1	254	224.3	119.2
15	13.2	07.0	75	66.2	35.2	135	119.2	63.4	195	172.2	91.5	255	225.2	119.7
16	14.1	07.5	76	67.1	35.7	136	120.1	63.8	196	173.1	92.0	256	226.0	120.2
17	15.0	08.0	77	68.0	36.1	137	121.0	64.3	197	173.9	92.5	257	226.9	120.7
18	15.9	08.5	78	68.9	36.6	138	121.8	64.8	198	174.8	93.0	258	227.8	121.1
19	16.8	08.9	79	69.8	37.1	139	122.7	65.3	199	175.7	93.4	259	228.7	121.6
20	17.7	09.4	80	70.6	37.6	140	123.6	65.7	200	176.6	93.9	260	229.6	122.1
21	18.5	09.9	81	71.5	38.0	141	124.5	66.2	201	177.5	94.4	261	230.4	122.5
22	19.4	10.3	82	72.4	38.5	142	125.4	66.7	202	178.4	94.8	262	331.3	123.0
23	20.3	10.8	83	73.3	39.0	143	126.3	67.1	203	179.2	95.3	263	232.2	123.5
24	21.2	11.3	84	74.2	39.4	144	127.1	67.6	204	180.1	95.8	264	233.1	123.9
25	22.1	11.7	85	75.1	39.9	145	128.0	68.1	205	181.0	96.2	265	234.0	124.4
26	23.0	12.2	86	75.9	40.4	146	128.9	68.5	206	181.9	96.7	266	234.9	124.9
27	23.8	12.7	87	76.8	40.8	147	129.8	69.0	207	182.8	97.2	267	235.7	125.3
28	24.7	13.1	88	77.7	41.3	148	130.7	69.5	208	183.7	97.7	268	236.6	125.8
29	25.6	13.6	89	78.6	41.8	149	131.6	70.0	209	184.5	98.1	269	237.5	126.3
30	26.5	14.1	90	79.5	42.3	150	132.4	70.4	210	185.4	98.6	270	238.4	126.8
31	27.4	14.6	91	80.3	42.7	151	133.3	70.9	211	186.3	99.1	271	239.3	127.2
32	28.3	15.0	92	81.2	43.2	152	134.2	71.4	212	187.2	99.5	272	240.2	127.7
33	29.1	15.5	93	82.1	43.7	153	135.1	71.8	213	188.1	100.0	273	241.0	128.2
34	30.0	16.0	94	83.0	44.1	154	136.0	72.3	214	189.0	100.5	274	241.9	128.6
35	30.9	16.4	95	83.9	44.6	155	136.9	72.8	215	189.8	100.9	275	242.8	129.1
36	31.8	16.9	96	84.8	45.1	156	137.7	73.2	216	190.7	101.4	276	243.7	129.6
37	32.7	17.4	97	85.6	45.5	157	138.6	73.7	217	191.6	101.9	277	244.6	130.0
38	33.6	17.8	98	86.5	46.0	158	139.5	74.2	218	192.5	102.3	278	245.5	130.5
39	34.4	18.3	99	87.4	46.5	159	140.4	74.6	219	193.4	102.8	279	246.3	131.0
40	35.3	18.8	100	88.3	46.9	160	141.3	75.1	220	194.2	103.3	280	247.2	131.5
41	36.2	19.2	101	89.2	47.4	161	142.2	75.6	221	195.1	103.8	281	248.1	131.9
42	37.1	19.7	102	90.1	47.9	162	143.0	76.1	222	196.0	104.2	282	249.0	132.4
43	38.0	20.2	103	90.9	48.4	163	143.9	76.5	223	196.9	104.7	283	249.9	132.9
44	38.8	20.7	104	91.8	48.8	164	144.8	77.0	224	197.8	105.2	284	250.8	133.3
45	39.7	21.1	105	92.7	49.3	165	145.7	77.5	225	198.7	105.6	285	251.6	133.8
46	40.6	21.6	106	93.6	49.8	166	146.6	77.9	226	199.5	106.1	286	252.5	134.3
47	41.5	22.1	107	94.5	50.2	167	147.5	78.4	227	200.4	106.6	287	253.4	134.7
48	42.4	22.5	108	95.4	50.7	168	148.3	78.9	228	201.3	107.0	288	254.3	135.2
49	43.3	23.0	109	96.2	51.2	169	149.2	79.3	229	202.2	107.5	289	255.2	135.7
50	44.1	23.5	110	97.1	51.6	170	150.1	79.8	230	203.1	108.0	290	256.1	136.1
51	45.0	23.9	111	98.0	52.1	171	151.9	80.3	231	204.0	108.4	291	256.9	136.6
52	45.9	24.4	112	98.9	52.6	172	151.9	80.7	232	204.8	108.9	292	257.8	137.1
53	46.8	24.9	113	99.8	53.1	173	152.7	81.2	233	205.7	109.4	293	258.7	137.6
54	47.7	25.4	114	100.7	53.5	174	153.6	81.7	234	206.6	109.9	294	259.6	138.0
55	48.6	25.8	115	101.5	54.0	175	154.5	82.2	235	207.5	110.3	295	260.5	138.5
56	49.4	26.3	116	102.4	54.5	176	155.4	82.6	236	208.4	110.8	296	261.3	139.0
57	50.3	26.8	117	103.3	54.9	177	156.3	83.1	237	209.3	111.3	297	262.2	139.4
58	51.2	27.2	118	104.2	55.4	178	157.2	83.6	238	210.1	111.7	298	263.1	139.9
59	52.1	27.7	119	105.1	55.9	179	158.0	84.0	239	211.0	112.2	299	264.0	140.4
60	53.0	28.2	120	106.0	56.3	180	158.9	84.5	240	211.9	112.7	300	264.9	140.8
Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.

For 62 Degrees.

TABLE II.

Difference of Latitude and Departure for 29 Degrees.

Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.
1	00.9	00.5	61	53.4	29.6	121	105.8	58.7	181	158.3	87.8	241	210.8	116.8
2	01.7	01.0	62	54.2	30.1	122	106.7	59.1	182	159.2	88.2	242	211·7	117.3
3	02.6	01.5	63	55.1	30.5	123	107.6	59.6	183	160.1	88.7	243	212.5	117.8
4	03.5	01.9	64	56.0	31.0	124	108.5	60.1	184	160.9	89.2	244	213·4	118.3
5	04.4	02.4	65	56.9	31.5	125	109.3	60.6	185	161.8	89.7	245	214.3	118.8
6	05.2	02.9	66	57.7	32.0	126	110.2	61.1	186	162.7	90.2	246	215.2	119.3
7	06.1	03.4	67	58.6	32.5	127	111.1	61.6	187	163.6	90.7	247	216.0	119.7
8	07.0	03.9	68	59.5	33.0	128	112.0	62.1	188	164.4	91.1	248	216.9	120.2
9	07.9	04.4	69	60.3	33.5	129	112.8	62.5	189	165.3	91.6	249	217.8	120.7
10	08.7	04.8	70	61.2	33.9	130	113.7	63.0	190	166.2	92.1	250	218.7	121.2
11	09.6	05.3	71	62.1	34.4	131	114.6	63.5	191	167.1	92.6	251	219.5	121.7
12	10.5	05.8	72	63.0	34.9	132	115.4	64.0	192	167.9	93.1	252	220.4	122.2
13	11.4	06.3	73	63.8	35.4	133	116.3	64.5	193	168.8	93.6	253	221.3	122.7
14	12.2	06.8	74	64.7	35.9	134	117.2	65.0	194	169.7	94.1	254	222.2	123.1
15	13.1	07.3	75	65.6	36.4	135	118.1	65.4	195	170.6	94.5	255	223.0	123.6
16	14.0	07.8	76	66.5	36.8	136	118.9	65.9	196	171.4	95.0	256	223.9	124.1
17	14.9	08.2	77	67.3	37.3	137	119.8	66.4	197	172.3	95.5	257	224.8	124.6
18	15.7	08.7	78	68.2	37.8	138	120.7	66.9	198	173.2	96.0	258	225.7	125.1
19	16.6	09.2	79	69.1	38.3	139	121.6	67.4	199	174.0	96.5	259	226.5	125.6
20	17.5	09.7	80	70.0	38.8	140	122.4	67.9	200	174.9	97.0	260	227.4	126.1
21	18.4	10.2	81	70.8	39.3	141	123.3	68.4	201	175.8	97.4	261	228.3	126.5
22	19.2	10.7	82	71.7	39.8	142	124.2	68.8	202	176.7	97.9	262	229.2	127.0
23	20.1	11.2	83	72.6	40.2	143	125.1	69.3	203	177.5	98.4	263	230.0	127.5
24	21.0	11.6	84	73.5	40.7	144	125.9	69.8	204	178.4	98.9	264	230.9	128.0
25	21.9	12.1	85	74.3	41.2	145	126.8	70.3	205	179.3	99.4	265	231.8	128.5
26	22.7	12.6	86	75.2	41.7	146	127.7	70.8	206	180.2	99.9	266	232.6	129.0
27	23.6	13.1	87	76.1	42.2	147	128.6	71.3	207	181.0	100.4	267	233.5	129.4
28	24.5	13.6	88	77.0	42.7	148	129.4	71.8	208	181.9	100.8	268	234.4	129.9
29	25.4	14.1	89	77.8	43.1	149	130.3	72.2	209	182.8	101.3	269	235.3	130.4
30	26.2	14.5	90	78.7	43.6	150	131.2	72.7	210	183.7	101.8	270	236.1	130.9
31	27.1	15.0	91	79.6	44.1	151	132.1	73.2	211	184.5	102.3	271	237.0	131.4
32	28.0	15.5	92	80.5	44.6	152	132.9	73.7	212	185.4	102.8	272	237.9	131.9
33	28.9	16.0	93	81.3	45.1	153	133.8	74.2	213	186.3	103.3	273	238.8	132.4
34	29.7	16.5	94	82.2	45.6	154	134.7	74.7	214	187.2	103.7	274	239.6	132.8
35	30.6	17.0	95	83.1	46.1	155	135.6	75.1	215	188.0	104.2	275	240.5	133.3
36	31.5	17.5	96	84.0	46.5	156	136.4	75.6	216	188.9	104.7	276	241.4	133.8
37	32.4	17.9	97	84.8	47.0	157	137.3	76.1	217	189.8	105.2	277	242.3	134.3
38	33.2	18.4	98	85.7	47.5	158	138.2	76.6	218	190.7	105.7	278	243.1	134.8
39	34.1	18.9	99	86.6	48.0	159	139.1	77.1	219	191.5	106.2	279	244.0	135.3
40	35.0	19.4	100	87.5	48.5	160	139.9	77.6	220	192.4	106.7	280	244.9	135.7
41	35.9	19.9	101	88.3	49.0	161	140.8	78.1	221	193.3	107.1	281	245.8	136.2
42	36.7	20.4	102	89.2	49.5	162	141.7	78.5	222	194.2	107.6	282	246.6	136.7
43	37.6	20.8	103	90.1	49.9	163	142.6	79.0	223	195.0	108.1	283	247.5	137.2
44	38.5	21.3	104	91.0	50.4	164	143.4	79.5	224	195.9	108.6	284	248.4	137.7
45	39.4	21.8	105	91.8	50.9	165	144.3	80.0	225	196.8	109.1	285	249.3	138.2
46	40.2	22.3	106	92.7	51.4	166	145.2	80.5	226	197.7	109.6	286	250.1	138.7
47	41.1	22.8	107	93.6	51.9	167	146.1	81.0	227	198.5	110.1	287	251.0	139.1
48	42.0	23.3	108	94.5	52.4	168	146.9	81.4	228	199.4	110.5	288	251.9	139.6
49	42.9	23.8	109	95.3	52.8	169	147.8	81.9	229	200.3	111.0	289	252.8	140.1
50	43.7	24.2	110	96.2	53.3	170	148.7	82.4	230	201.2	111.5	290	253.6	140.6
51	44.6	24.7	111	97.1	53.8	171	149.6	82.9	231	202.0	112.0	291	254.5	141.1
52	45.5	25.2	112	98.0	54.3	172	150.4	83.4	232	202.9	112.5	292	255.4	141.6
53	46.4	25.7	113	98.8	54.8	173	151.3	83.9	233	203.8	113.0	293	256.3	142.0
54	47.2	26.2	114	99.7	55.3	174	152.2	84.4	234	204.7	113.4	294	257.1	142.5
55	48.1	26.7	115	100.6	55.8	175	153.1	84.8	235	205.5	113.9	295	258.0	143.0
56	49.0	27.1	116	101.5	56.2	176	153.9	85.3	236	206.4	114.4	296	258.9	143.5
57	49.9	27.6	117	102.3	56.7	177	154.8	85.8	237	207.3	114.9	297	259.8	144.0
58	50.7	28.1	118	103.2	57.2	178	155.7	86.3	238	208.2	115.4	298	260.6	144.5
59	51.6	28.6	119	104.1	57.7	179	156.6	86.8	239	209.0	115.9	299	261.5	145.0
60	52.5	29.1	120	105.0	58.2	180	157.4	87.3	240	209.9	116.4	300	262.4	145.4
Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.

For 61 Degrees.

TABLE II.

Difference of Latitude and Departure for 30 Degrees.

Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.
1	00.9	00.5	61	52.8	30.5	121	104.8	60.5	181	156.8	90.5	241	208.7	120.5
2	01.7	01.0	62	53.7	31.0	122	105.7	61.0	182	157.6	91.0	242	209.6	121.0
3	02.6	01.5	63	54.6	31.5	123	106.5	61.5	183	158.5	91.5	243	210.4	121.5
4	03.5	02.0	64	55.4	32.0	124	107.4	62.0	184	159.3	92.0	244	211.3	122.0
5	04.3	02.5	65	56.3	32.5	125	108.3	62.5	185	160.2	92.5	245	212.2	122.5
6	05.2	03.0	66	57.2	33.0	126	109.1	63.0	186	161.1	93.0	246	213.0	123.0
7	06.1	63.5	67	58.0	33.5	127	110.0	63.5	187	161.9	93.5	247	213.9	123.5
8	06.9	04.0	68	58.9	34.0	128	110.9	64.0	188	162.8	94.0	248	214.8	124.0
9	07.8	04.5	69	59.8	34.5	129	111.7	64.5	189	163.7	94.5	249	215.6	124.5
10	08.7	05.0	70	60.6	35.0	130	112.6	65.0	190	164.5	95.0	250	216.5	125.0
11	09.5	05.5	71	61.5	35.5	131	113.4	65.5	191	165.4	95.5	251	217.4	125.5
12	10.4	06.0	72	62.4	36.0	132	114.3	66.0	192	166.3	96.0	252	218.2	126.0
13	11.3	06.5	73	63.2	36.5	133	115.2	66.5	193	167.1	96.5	253	219.1	126.5
14	12.1	07.0	74	64.1	37.0	134	116.0	67.0	194	168.0	97.0	254	220.0	127.0
15	13.0	07.5	75	65.0	37.5	135	116.9	67.5	195	168.9	97.5	255	220.8	127.5
16	13.9	08.0	76	65.8	38.0	136	117.8	68.0	196	169.7	98.0	256	221.7	128.0
17	14.7	08.5	77	66.7	38.5	137	118.6	68.5	197	170.6	98.5	257	222.6	128.5
18	15.6	09.0	78	67.5	39.0	138	119.5	69.0	198	171.5	99.0	258	223.4	129.0
19	16.5	09.5	79	68.4	39.5	139	120.4	69.5	199	172.3	99.5	259	224.3	129.5
20	17.3	10.0	80	69.3	40.0	140	121.2	70.0	200	173.2	100.0	260	225.2	130.0
21	18.2	10.5	81	70.1	40.5	141	122.1	70.5	201	174.1	100.5	261	226.0	130.5
22	19.1	11.0	82	71.0	41.0	142	123.0	71.0	202	174.9	101.0	262	226.9	131.0
23	19.9	11.5	83	71.9	41.5	143	123.8	71.5	203	175.8	101.5	263	227.8	131.5
24	20.8	12.0	84	72.7	42.0	144	124.7	72.0	204	176.7	102.0	264	228.6	132.0
25	21.7	12.5	85	73.6	42.5	145	125.6	72.5	205	177.5	102.5	265	229.5	132.5
26	22.5	13.0	86	74.5	43.0	146	126.4	73.0	206	178.4	103.0	266	230.4	133.0
27	23.4	13.5	87	75.3	43.5	147	127.3	73.5	207	179.3	103.5	267	231.2	133.5
28	24.2	14.0	88	76.2	44.0	148	128.2	74.0	208	180.1	104.0	268	232.1	134.0
29	25.1	14.5	89	77.1	44.5	149	129.0	74.5	209	181.0	104.5	269	233.0	134.5
30	26.0	15.0	90	77.9	45.0	150	129.9	75.0	210	181.9	105.0	270	233.8	135.0
31	26.8	15.5	91	78.8	45.5	151	130.8	75.5	211	182.7	105.5	271	234.7	135.5
32	27.7	16.0	92	79.7	46.0	152	131.6	76.0	212	183.6	106.0	272	235.6	136.0
33	28.6	16.5	93	80.5	46.5	153	132.5	76.5	213	184.5	106.5	273	236.4	136.5
34	29.4	17.0	94	81.4	47.0	154	133.4	77.0	214	185.3	107.0	274	237.3	137.0
35	30.3	17.5	95	82.3	47.5	155	134.2	77.5	215	186.2	107.5	275	238.2	137.5
36	31.2	18.0	96	83.1	48.0	156	135.1	78.0	216	187.1	108.0	276	239.0	138.0
37	32.0	18.5	97	84.0	48.5	157	136.0	78.5	217	187.9	108.5	277	239.9	138.5
38	32.9	19.0	98	84.9	49.0	158	136.8	79.0	218	188.8	109.0	278	240.8	139.0
39	33.8	19.5	99	85.7	49.5	159	137.7	79.5	219	189.7	109.5	279	241.6	139.5
40	34.6	20.0	100	86.6	50.0	160	138.6	80.0	220	199.5	110.0	280	242.5	140.0
41	35.5	20.5	101	87.5	50.5	161	139.4	80.5	221	191.4	110.5	281	243.4	140.5
42	36.4	21.0	102	88.3	51.0	162	140.3	81.0	222	192.3	111.0	282	244.2	141.0
43	37.2	21.5	103	89.2	51.5	163	141.2	81.5	223	193.1	111.5	283	245.1	141.5
44	38.1	22.0	104	90.1	52.0	164	142.0	82.0	224	194.0	112.0	284	246.0	142.0
45	39.0	22.5	105	90.9	52.5	165	142.9	82.5	225	194.9	112.5	285	246.8	142.5
46	39.8	23.0	106	91.8	53.0	166	143.8	83.0	226	195.7	113.0	286	247.7	143.0
47	40.7	23.5	107	92.7	53.5	167	144.6	83.5	227	196.6	113.5	287	248.5	143.5
48	41.6	24.0	108	93.5	54.0	168	145.5	84.0	228	197.5	114.0	288	249.4	144.0
49	42.4	24.5	109	94.4	54.5	169	146.4	84.5	229	198.3	114.5	289	250.3	144.5
50	43.3	25.0	110	95.3	55.0	170	147.2	85.0	230	199.2	115.0	290	251.1	145.0
51	44.2	25.5	111	96.1	55.5	171	148.1	85.5	231	200.1	115.5	291	252.0	145.5
52	45.0	26.0	112	97.0	56.0	172	149.0	86.0	232	200.9	116.0	292	252.9	146.0
53	45.9	26.5	113	97.9	56.5	173	149.8	86.5	233	201.8	116.5	293	253.7	146.5
54	46.8	27.0	114	98.7	57.0	174	150.7	87.0	234	202.6	117.0	294	254.6	147.0
55	47.6	27.5	115	99.6	57.5	175	151.6	87.5	235	203.5	117.5	295	255.5	147.5
56	48.5	28.0	116	100.5	58.0	176	152.4	88.0	236	204.4	118.0	296	256.3	148.0
57	49.4	28.5	117	101.3	58.5	177	153.3	88.5	237	205.2	118.5	297	257.2	148.5
58	50.2	29.0	118	102.2	59.0	178	154.2	89.0	238	206.1	119.0	298	258.1	149.0
59	51.1	29.5	119	103.1	59.5	179	155.0	89.5	239	207.0	119.5	299	258.9	149.5
60	52.0	30.0	120	103.9	69.0	180	155.9	90.0	240	207.8	120.0	300	259.8	150.0
Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.

For 60 Degrees.

TABLE II.

Difference of Latitude and Departure for 31 Degrees.

Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.
1	00.9	00.5	61	52.3	31.4	121	103.7	62.3	181	155.1	93.2	241	206.6	124.1
2	01.7	01.0	62	53.1	31.9	122	104.6	62.8	182	156.0	93.7	242	207.4	124.6
3	02.0	01.5	63	54.0	32.4	123	105.4	63.3	183	156.9	94.3	243	208.3	125.2
4	03.4	02.1	64	54.9	33.0	124	106.3	63.9	184	157.7	94.8	244	209.1	125.7
5	04.3	02.6	65	55.7	33.5	125	107.1	64.4	185	158.6	95.3	245	210.0	126.2
6	05.1	03.1	66	56.6	34.0	126	108.0	64.9	186	159.4	95.8	246	210.9	126.7
7	06.0	03.6	67	57.4	34.5	127	108.9	65.4	187	160.3	96.3	247	211.7	127.2
8	06.9	04.1	68	58.3	35.0	128	109.7	65.9	188	161.1	96.8	248	212.6	127.7
9	07.7	04.6	69	59.1	35.5	129	110.6	66.4	189	162.0	97.3	249	213.4	128.2
10	08.6	05.2	70	60.0	36.1	130	111.4	67.0	190	162.9	97.9	250	214.3	128.8
11	09.4	05.7	71	60.9	36.6	131	112.3	67.5	191	163.7	98.4	251	215.1	129.3
12	10.3	06.2	72	61.7	37.1	132	113.1	68.0	192	164.6	98.9	252	216.0	129.8
13	11.1	06.7	73	62.6	37.6	133	114.0	68.5	193	165.4	99.4	253	216.9	130.3
14	12.0	07.2	74	63.4	38.1	134	114.9	69.0	194	166.3	99.9	254	217.7	130.8
15	12.9	07.7	75	64.3	38.6	135	115.7	69.5	195	167.1	100.4	255	218.6	131.3
16	13.7	08.2	76	65.1	39.1	136	116.6	70.0	196	168.0	100.9	256	219.4	131.8
17	14.6	08.8	77	66.0	39.7	137	117.4	70.6	197	168.9	101.5	257	220.3	132.4
18	15.4	09.3	78	66.9	40.2	138	118.3	71.1	198	169.7	102.0	258	221.1	132.9
19	16.3	09.8	79	67.7	40.7	139	119.1	71.6	199	170.6	102.5	259	222.0	133.4
20	17.1	10.3	80	68.6	41.2	140	120.0	72.1	200	171.4	103.0	260	222.9	133.9
21	18.0	10.8	81	69.4	41.7	141	120.9	72.6	201	172.3	103.5	261	223.7	134.4
22	18.9	11.3	82	70.3	42.2	142	121.7	73.1	202	173.1	104.0	262	224.6	134.9
23	19.7	11.8	83	71.1	42.7	143	122.6	73.7	203	174.0	104.6	263	225.4	135.5
24	20.6	12.4	84	72.0	43.3	144	123.4	74.2	204	174.9	105.1	264	226.3	136.0
25	21.4	12.9	85	72.9	43.8	145	124.3	74.7	205	175.7	105.6	265	227.1	136.5
26	22.3	13.4	86	73.7	44.3	146	125.1	75.2	206	176.6	106.1	266	228.0	137.0
27	23.1	13.9	87	74.6	44.8	147	126.0	75.7	207	177.4	106.6	267	228.9	137.5
28	24.0	14.4	88	75.4	45.3	148	126.9	76.2	208	178.3	107.1	268	229.7	138.0
29	24.9	14.9	89	76.3	45.8	149	127.7	76.7	209	179.1	107.6	269	230.6	138.5
30	25.7	15.5	90	77.1	46.4	150	128.6	77.3	210	180.0	108.2	270	231.4	139.1
31	26.6	16.0	91	78.0	46.9	151	129.4	77.8	211	180.9	108.7	271	232.3	139.6
32	27.4	16.5	92	78.9	47.4	152	130.3	78.3	212	181.7	109.2	272	233.1	140.1
33	28.3	17.0	93	79.7	47.9	153	131.1	78.8	213	182.6	109.7	273	234.0	140.6
34	29.1	17.5	94	80.6	48.4	154	132.0	79.3	214	183.4	110.2	274	234.9	141.1
35	30.0	18.0	95	81.4	48.9	155	132.9	79.8	215	184.3	110.7	275	235.7	141.6
36	30.9	18.5	96	82.3	49.4	156	133.7	80.3	216	185.1	111.2	276	236.6	142.2
37	31.7	19.1	97	83.1	50.0	157	134.6	80.9	217	186.0	111.8	277	237.4	142.7
38	32.6	19.6	98	84.0	50.5	158	135.4	81.4	218	186.9	112.3	278	238.3	143.2
39	33.4	20.1	99	84.9	51.0	159	136.3	81.9	219	187.7	112.8	279	239.1	143.7
40	34.3	20.6	100	85.7	51.5	160	137.1	82.4	220	188.6	113.3	280	240.0	144.2
41	35.1	21.1	101	86.6	52.0	161	138.0	82.9	221	189.4	113.8	281	240.9	144.7
42	36.0	21.6	102	87.4	52.5	162	138.9	83.4	222	190.3	114.3	282	241.7	145.2
43	36.9	22.1	103	88.3	53.0	163	139.7	84.0	223	191.1	114.9	283	242.6	145.8
44	37.7	22.7	104	89.1	53.6	164	140.6	84.5	224	192.0	115.4	284	243.4	146.3
45	38.6	23.2	105	90.0	54.1	165	141.4	85.0	225	192.9	115.9	285	244.3	146.8
46	39.4	23.7	106	90.9	54.6	166	142.3	85.5	226	193.7	116.4	286	245.1	147.3
47	40.3	24.2	107	91.7	55.1	167	143.1	86.0	227	194.6	116.9	287	246.0	147.8
48	41.1	24.7	108	92.6	55.6	168	144.0	86.5	228	195.4	117.4	288	246.9	148.3
49	42.0	25.2	109	93.4	56.1	169	144.9	87.0	229	196.3	117.9	289	247.7	148.8
50	42.9	25.8	110	94.3	56.7	170	145.7	87.6	230	197.1	118.5	290	248.6	149.4
51	43.7	26.3	111	95.1	57.2	171	146.6	88.1	231	198.0	119.0	291	249.4	149.9
52	44.6	26.8	112	96.0	57.7	172	147.4	88.6	232	198.9	119.5	292	250.3	150.4
53	45.4	27.3	113	96.9	58.2	173	148.3	89.1	233	199.7	120.0	293	251.2	150.9
54	46.3	27.8	114	97.7	58.7	174	149.1	89.6	234	200.6	120.5	294	252.0	151.4
55	47.1	28.3	115	98.6	59.2	175	150.0	90.1	235	201.4	121.0	295	252.9	151.9
56	48.0	28.8	116	99.4	59.7	176	150.9	90.6	236	202.3	121.5	296	253.7	152.5
57	48.9	29.4	117	100.3	60.3	177	151.7	91.2	237	203.1	122.1	297	254.6	153.0
58	49.7	29.9	118	101.1	60.8	178	152.6	91.7	238	204.0	122.6	298	255.4	153.5
59	50.6	30.4	119	102.0	61.3	179	153.4	92.2	239	204.9	123.1	299	256.3	154.0
60	51.4	30.9	120	102.9	61.8	180	154.3	92.7	240	205.7	123.6	300	257.1	154.5
Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.

For 59 Degrees.

TABLE II.

Difference of Latitude and Departure for 32 Degrees.

Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.
1	00.8	00.5	61	51.7	32.3	121	102.6	64.1	181	153.5	95.9	241	204.4	127.7
2	01.7	01.1	62	52.6	32.9	122	103.5	64.7	182	154.3	96.4	242	205.2	128.2
3	02.5	01.6	63	53.4	33.4	123	104.3	65.2	183	155.2	97.0	243	206.1	128.8
4	03.4	02.1	64	54.3	33.9	124	105.2	65.7	184	156.0	97.5	244	206.9	129.3
5	04.2	02.6	65	55.1	34.4	125	106.0	66.2	185	156.9	98.0	245	207.8	129.8
6	05.1	03.2	66	56.0	35.0	126	106.9	66.8	186	157.7	98.6	246	208.6	130.4
7	05.9	03.7	67	56.8	35.5	127	107.7	67.3	187	158.6	99.1	247	209.5	130.9
8	06.8	04.2	68	57.7	36.0	128	108.6	67.8	188	159.4	99.6	248	210.3	131.4
9	07.6	04.8	69	58.5	36.6	129	109.4	68.4	189	160.3	100.2	249	211.2	131.9
10	08.5	05.3	70	59.4	37.1	130	110.2	68.9	190	161.1	100.7	250	212.0	132.5
11	09.3	05.8	71	60.2	37.6	131	111.1	69.4	191	162.0	101.2	251	212.9	133.0
12	10.2	06.4	72	61.1	38.2	132	111.9	69.9	192	162.8	101.7	252	213.7	133.5
13	11.0	06.9	73	61.9	38.7	133	112.8	70.5	193	163.7	102.3	253	214.6	134.1
14	11.9	07.4	74	62.8	39.2	134	113.6	71.0	194	164.5	102.8	254	215.4	134.6
15	12.7	07.9	75	63.6	39.7	135	114.5	71.5	195	165.4	103.3	255	216.3	135.1
16	13.6	08.5	76	64.5	40.3	136	115.3	72.1	196	166.2	103.9	256	217.1	135.7
17	14.4	09.0	77	65.3	40.8	137	116.2	72.6	197	167.1	104.4	257	217.9	136.2
18	15.3	09.5	78	66.1	41.3	138	117.0	73.1	198	167.9	104.9	258	218.8	136.7
19	16.1	10.1	79	67.0	41.9	139	117.9	73.7	199	168.8	105.5	259	219.6	137.2
20	17.0	10.6	80	67.8	42.4	140	118.7	74.2	200	169.6	106.0	260	220.5	137.8
21	17.8	11.1	81	68.7	42.9	141	119.6	74.7	201	170.5	106.5	261	221.3	138.3
22	18.7	11.7	82	69.5	43.5	142	120.4	75.2	202	171.3	107.0	262	222.2	138.8
23	19.5	12.2	83	70.4	44.0	143	121.3	75.8	203	172.2	107.6	263	223.0	139.4
24	20.4	12.7	84	71.2	44.5	144	122.1	76.3	204	173.0	108.1	264	223.9	139.9
25	21.2	13.2	85	72.1	45.0	145	123.0	76.8	205	173.8	108.6	265	224.7	140.4
26	22.0	13.8	86	72.9	45.6	146	123.8	77.4	206	174.7	109.2	266	225.6	141.0
27	22.9	14.3	87	73.8	46.1	147	124.7	77.9	207	175.5	109.7	267	226.4	141.5
28	23.7	14.8	88	74.6	46.6	148	125.5	78.4	208	176.4	110.2	268	227.3	142.0
29	24.6	15.4	89	75.5	47.2	149	126.4	79.0	209	177.2	110.8	269	228.1	142.5
30	25.4	15.9	90	76.3	47.7	150	127.2	79.5	210	178.1	111.3	270	229.0	143.1
31	26.3	16.4	91	77.2	48.2	151	128.1	80.0	211	178.9	111.8	271	229.8	143.6
32	27.1	17.0	92	78.0	48.8	152	128.9	80.5	212	179.8	112.3	272	230.7	144.1
33	28.0	17.5	93	78.9	49.3	153	129.8	81.1	213	180.6	112.9	273	231.5	144.7
34	28.8	18.0	94	79.7	49.8	154	130.6	81.6	214	181.5	113.4	274	232.4	145.2
35	29.7	18.5	95	80.6	50.3	155	131.4	82.1	215	182.3	113.9	275	233.2	145.7
36	30.5	19.1	96	81.4	50.9	156	132.3	82.7	216	183.2	114.5	276	234.1	146.3
37	31.4	19.6	97	82.3	51.4	157	133.1	83.2	217	184.0	115.0	277	234.9	146.8
38	32.2	20.1	98	83.1	51.9	158	134.0	83.7	218	184.9	115.5	278	235.8	147.3
39	33.1	20.7	99	84.0	52.5	159	134.8	84.3	219	185.7	116.1	279	236.6	147.8
40	33.9	21.2	100	84.8	53.0	160	135.7	84.8	220	186.6	116.6	280	237.5	148.4
41	34.8	21.7	101	85.7	53.5	161	136.5	85.3	221	187.4	117.1	281	238.3	148.9
42	35.6	22.3	102	86.5	54.1	162	137.4	85.8	222	188.3	117.6	282	239.1	149.4
43	36.5	22.8	103	87.3	54.6	163	138.2	86.4	223	189.1	118.2	283	240.0	150.0
44	37.3	23.3	104	88.2	55.1	164	139.1	86.9	224	190.0	118.7	284	240.8	150.5
45	38.2	23.8	105	89.0	55.6	165	139.9	87.4	225	190.8	119.2	285	241.7	151.0
46	39.0	24.4	106	89.9	56.2	166	140.8	88.0	226	191.7	119.8	286	242.5	151.6
47	39.9	24.9	107	90.7	56.7	167	441.6	88.5	227	192.5	120.3	287	243.4	152.1
48	40.7	25.4	108	91.6	57.2	168	142.5	89.0	228	193.4	120.8	288	244.2	152.6
49	41.6	26.0	109	92.4	57.8	169	143.3	89.6	229	194.2	121.4	289	245.1	153.1
50	42.4	26.5	110	93.3	58.3	170	144.2	90.1	230	195.1	121.9	290	245.9	153.7
51	43.3	27.0	111	94.1	58.8	171	145.0	90.6	231	195.9	122.4	291	246.8	154.2
52	44.1	27.6	112	95.0	59.4	172	145.9	91.1	232	196.7	122.9	292	247.6	154.7
53	44.9	28.1	113	95.8	59.9	173	146.7	91.7	233	197.6	123.5	293	248.5	155.3
54	45.8	28.6	114	96.7	60.4	174	147.6	92.2	234	198.4	124.0	294	249.3	155.8
55	46.6	29.1	115	97.5	60.9	175	148.4	92.7	235	199.3	124.5	295	250.2	156.3
56	47.5	29.7	116	98.4	61.5	176	149.3	93.3	236	200.1	125.1	296	251.0	156.9
57	48.3	30.2	117	99.2	62.0	177	150.1	93.8	237	201.0	125.6	297	251.9	157.4
58	49.2	30.7	118	100.1	62.5	178	151.0	94.3	238	201.8	126.1	298	252.7	157.9
59	50.0	31.3	119	100.9	63.1	179	151.8	94.9	239	202.7	126.7	299	253.6	158.4
60	50.9	31.8	120	101.8	63.6	180	152.6	95.4	240	203.5	127.2	300	254.4	159.0
Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.

For 58 Degrees.

TABLE II.

Difference of Latitude and Departure for 33 Degrees.

Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat	Dep.	Dist	Lat.	Dep.
1	00.8	00.5	61	51.2	33.2	121	101.5	65.9	181	151.8	98.6	241	202.1	131.3
2	01.7	01.1	62	52.0	33.8	122	102.3	66.4	182	152.6	99.1	242	203.0	131.8
3	02.5	01.6	63	52.8	34.3	123	103.2	67.0	183	153.5	99.7	243	203.8	132.3
4	03.4	02.2	64	53.7	34.9	124	104.0	67.5	184	154.3	100.2	244	204.6	132.9
5	04.2	02.7	65	54.5	35.4	125	104.8	68.1	185	155.2	100.8	245	205.5	133.4
6	05.0	03.3	66	55.4	35.9	126	105.7	68.6	186	156.0	101.3	246	206.3	134.0
7	05.9	03.8	67	56.2	36.5	127	106.5	69.2	187	156.8	101.8	247	207.2	134.5
8	06.7	04.4	68	57.0	37.0	128	107.3	69.7	188	157.7	102.4	248	208.0	135.1
9	07.5	04.9	69	57.9	37.6	129	108.2	70.3	189	158.5	102.9	249	208.8	135.6
10	08.4	05.4	70	58.7	38.1	130	109.0	70.8	190	159.3	103.5	250	209.7	136.2
11	09.2	06.0	71	59.5	38.7	131	109.9	71.3	191	160.2	104.0	251	210.5	136.7
12	10.1	06.5	72	60.4	39.2	132	110.7	71.9	192	161.0	104.6	252	211.3	137.2
13	10.9	07.1	73	61.2	39.8	133	111.5	72.4	193	161.9	105.1	253	212.2	137.8
14	11.7	07.6	74	62.1	40.3	134	112.4	73.0	194	162.7	105.7	254	213.0	138.3
15	12.6	08.2	75	62.9	40.8	135	113.2	73.5	195	163.5	106.2	255	213.9	138.9
16	13.4	08.7	76	63.7	41.4	136	114.1	74.1	196	164.4	106.7	256	214.7	139.4
17	14.3	09.3	77	64.6	41.9	137	114.9	74.6	197	165.2	107.3	257	215.5	140.0
18	15.1	09.8	78	65.4	42.5	138	115.7	75.2	198	166.1	107.8	258	216.4	140.5
19	15.9	10.3	79	66.3	43.0	139	116.6	75.7	199	166.9	108.4	259	217.2	141.1
20	16.8	10.9	80	67.1	43.6	140	117.4	76.2	200	167.7	108.9	260	218.1	141.6
21	17.6	11.4	81	67.9	44.1	141	118.3	76.8	201	168.6	109.5	261	218.9	142.2
22	18.5	12.0	82	68.8	44.7	142	119.1	77.3	202	169.4	110.0	262	219.7	142.7
23	19.3	12.5	83	69.6	45.2	143	119.9	77.9	203	170.3	110.6	263	220.6	143.2
24	20.1	13.1	84	70.4	45.7	144	120.8	78.4	204	171.1	111.1	264	221.4	143.8
25	21.0	13.6	85	71.3	46.3	145	121.6	79.0	205	171.9	111.7	265	222.2	144.3
26	21.8	14.2	86	72.1	46.8	146	122.4	79.5	206	172.8	112.2	266	223.1	144.9
27	22.6	14.7	87	73.0	47.4	147	123.3	80.1	207	173.6	112.7	267	223.9	145.4
28	23.5	15.2	88	73.8	47.9	148	124.1	80.6	208	174.4	113.3	268	224.8	146.0
29	24.3	15.8	89	74.6	48.5	149	125.0	81.2	209	175.3	113.8	269	225.6	146.5
30	25.2	16.3	90	75.5	49.0	150	125.8	81.7	210	176.1	114.4	270	226.4	147.1
31	26.0	16.9	91	76.3	49.6	151	126.6	82.2	211	177.0	114.9	271	227.3	147.6
32	26.8	17.4	92	77.2	50.1	152	127.5	82.8	212	177.8	115.5	272	228.1	148.1
33	27.7	18.0	93	78.0	50.7	153	128.3	83.3	213	178.6	116.0	273	229.0	148.7
34	28.5	18.5	94	78.8	51.2	154	129.2	83.9	214	179.5	116.6	274	229.8	149.2
35	29.4	19.1	95	79.7	51.7	155	130.0	84.4	215	180.3	117.1	275	230.6	149.8
36	30.2	19.6	96	80.5	52.3	156	130.8	85.0	216	181.2	117.6	276	231.5	150.3
37	31.0	20.2	97	81.4	52.8	157	131.7	85.5	217	182.0	118.2	277	232.3	150.9
38	31.9	20.7	98	82.2	53.4	158	132.5	86.1	218	182.8	118.7	278	233.2	151.4
39	32.7	21.2	99	83.0	53.9	159	133.3	86.6	219	183.7	119.3	279	234.0	152.0
40	33.5	21.8	100	83.9	54.5	160	134.2	87.1	220	184.5	119.8	280	234.8	152.5
41	34.4	22.3	101	84.7	55.0	161	135.0	87.7	221	185.3	120.4	281	235.7	153.0
42	35.2	22.9	102	85.5	55.6	162	135.9	88.2	222	186.2	120.9	282	236.5	153.6
43	36.1	23.4	103	86.4	56.1	163	136.7	88.8	223	187.0	121.5	283	237.3	154.1
44	36.9	24.0	104	87.2	56.6	164	137.5	89.3	224	187.9	122.0	284	238.2	154.7
45	37.7	24.5	105	88.1	57.2	165	138.4	89.9	225	188.7	122.5	285	239.0	155.2
46	38.6	25.1	106	88.9	57.7	166	139·2	90.4	226	189.5	123.1	286	239.9	155.8
47	39.4	25.6	107	89.7	58.3	167	140.1	91.0	227	190.4	123.6	287	240.7	156.3
48	40.3	26.1	108	90.6	58.8	168	140.9	91.5	228	191.2	124.2	288	241.5	156.9
49	41.1	26.7	109	91.4	59.4	169	141.7	92.0	229	192.1	124.7	289	242.4	157.4
50	41.9	27.2	110	92.3	59.9	170	142.6	92.6	230	192.9	125.3	290	243.2	157.9
51	42.8	27.8	111	93.1	60.5	171	143.4	93.1	231	193.7	125.8	291	244.1	158.5
52	43.6	28.3	112	93.9	61.0	172	144.3	93.7	232	194.6	126.4	292	244.9	159.0
53	44.4	28.9	113	94.8	61.5	173	145.1	94.2	233	195.4	126.9	293	245.7	159.6
54	45.3	29.4	114	95.6	62.1	174	145.9	94.8	234	196.2	127.4	294	246.6	160.1
55	46.1	30.0	115	96.4	62.6	175	146.8	95.3	235	197.1	128.0	295	247.4	160.7
56	47.0	30.5	116	97.3	63.2	176	147.6	95.9	236	197.9	128.5	296	248.2	161.2
57	47.8	31.0	117	98.1	63.7	177	148.4	96.4	237	198.8	129.1	297	249.1	161.8
58	48.6	31.6	118	99.0	64.3	178	149.3	96.9	238	199.6	129.6	298	249.9	162.3
59	49.5	32.1	119	99.8	64.8	179	150.1	97.5	239	200.4	130.2	299	250.8	162.8
60	50.3	32.7	120	100.6	65.4	180	151.0	98.0	240	201.3	130.7	300	251.6	163.4
Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.

For 57 Degrees.

TABLE II.

Difference of Latitude and Departure for 34 Degrees

Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist
1	00.8	00.6	61	50.6	34.1	121	100.3	67.7	181	150.1	101.2	241
2	01.7	01.1	62	51.4	34.7	122	101.1	68.2	182	150.9	101.8	242
3	02.5	01.7	63	52.2	35.2	123	102.0	68.8	183	151.7	102.3	243
4	03.3	02.2	64	53.1	35.8	124	102.8	69.3	184	152.5	102.9	244
5	04.1	02.8	65	53.9	36.3	125	103.6	69.9	185	153.4	103.5	245
6	05.0	03.4	66	54.7	36.9	126	104.5	70.5	186	154.2	104.0	246
7	05.8	03.9	67	55.5	37.5	127	105.3	71.0	187	155.0	104.6	247
8	06.6	04.5	68	56.4	38.0	128	106.1	71.6	188	155.9	105.1	248
9	07.5	05.0	69	57.2	38.6	129	106.9	72.1	189	156.7	105.7	249
10	08.3	05.6	70	58.0	39.1	130	107.8	72.7	190	157.5	106.2	250
11	09.1	06.2	71	58.9	39.7	131	108.6	73.3	191	158.3	106.8	251
12	09.9	06.7	72	59.7	40.3	132	109.4	73.8	192	159.2	107.4	252
13	10.8	07.3	73	60.5	40.8	133	110.3	74.4	193	160.0	107.9	253
14	11.6	07.8	74	61.3	41.4	134	111.1	74.9	194	160.8	108.5	254
15	12.4	08.4	75	62.2	41.9	135	111.9	75.5	195	161.7	109.0	255
16	13.3	08.9	76	63.0	42.5	136	112.7	76.1	196	162.5	109.6	256
17	14.1	09.5	77	63.8	43.1	137	113·6	76.6	197	163.3	110.2	257
18	14.9	10.1	78	64.7	43.6	138	114.4	77.2	198	164.1	110.7	258
19	15.8	10.6	79	65.5	44.2	139	115.2	77.7	199	165.0	111.3	259
20	16.6	11.2	80	66.3	44.7	140	116.1	78.3	200	165.8	111.8	260
21	17.4	11.7	81	67.2	45.3	141	116.9	78.8	201	166.6	112.4	261
22	18.2	12.3	82	68.0	45.9	142	117.7	79.4	202	167.5	113.0	262
23	19.1	12.9	83	68.8	46.4	143	118.6	80.0	203	168.3	113.5	263
24	19.9	13.4	84	69.6	47.0	144	119.4	80.5	204	169.1	114.1	264
25	20.7	14.0	85	70.5	47.5	145	120.2	81.1	205	170.0	114.6	265
26	21.6	14.5	86	71.3	48.1	146	121.0	81.6	206	170.8	115.2	266
27	22.4	15.1	87	72.1	48.6	147	121.9	82.2	207	171.6	115.8	267
28	23.2	15.7	88	73.0	49.2	148	122.7	82.8	208	172.4	116.3	268
29	24.0	16.2	89	73.8	49.8	149	123.5	83.3	209	173.3	116.9	269
30	24.9	16.8	90	74.6	50.3	150	124.4	83.9	210	174.1	117.4	270
31	25.7	17.3	91	75.4	50.9	151	125.2	84.4	211	174.9	118.0	271
32	26.5	17.9	92	76.3	51.4	152	126.0	85.0	212	175.8	118.5	272
33	27.4	18.5	93	77.1	52.0	153	126.8	85.6	213	176.6	119.1	273
34	28.2	19.0	94	77.9	52.6	154	127.7	86.1	214	177.4	119.7	274
35	29.0	19.6	95	78.8	53.1	155	128.5	86.7	215	178.2	120.2	275
36	29.8	20.1	96	79·6	53.7	156	129.3	87.2	216	179.1	120.8	276
37	30.7	20.7	97	80.4	54.2	157	130.2	87.8	217	179.9	121.3	277
38	31.5	21.2	98	81.2	54.8	158	131.0	88.4	218	180.7	121.9	278
39	32.3	21.8	99	82.1	55.4	159	131.8	88.9	219	181.6	122.5	279
40	33.2	22.4	100	82.9	55.9	160	132.6	89.5	220	182.4	123.0	280
41	34.0	22.9	101	83.7	56.5	161	133.5	90.0	221	183.2	123.6	281
42	34.8	23.5	102	84.6	57.0	162	134.3	90.6	222	184.0	124.1	282
43	35.6	24.0	103	85.4	57.6	163	135.1	91.1	223	184.9	124.7	283
44	36.5	24.6	104	86.2	58.2	164	136.0	91.7	224	185.7	125.3	284
45	37.3	25.2	105	87.0	58.7	165	136.8	92.3	225	186.5	125.8	285
46	38.1	25.7	106	87.9	59.3	166	137.6	92.8	226	187.4	126.4	286
47	39.0	26.3	107	88.7	59.8	167	138.4	93.4	227	188.2	126.9	287
48	39.8	26.8	108	89.5	60.4	168	139.3	93.9	228	189.0	127.5	288
49	40.6	27.4	109	90.4	61.0	169	140.1	94.5	229	189.8	128.1	289
50	41.5	28.0	110	91.2	61.5	170	140.9	95.1	230	190.7	128.6	290
51	42.3	28.5	111	92.0	62.1	171	141.8	95.6	231	191.5	129.2	291
52	43.1	29.1	112	92.9	62.6	172	142.6	96.2	232	192.3	129.7	292
53	43.9	29.6	113	93.7	63.2	173	143.4	96.7	233	193.2	130.3	293
54	44.8	30.2	114	94.5	63.7	174	144.3	97.3	234	194.0	130.9	294
55	45.6	30.8	115	95.3	64.3	175	145.1	97.9	235	194.8	131.4	295
56	46.4	31.3	116	96.2	64.9	176	145.9	98.4	236	195.7	132.0	296
57	47.3	31.9	117	97.0	65.4	177	146.7	99.0	237	196.5	132.5	297
58	48.1	32.4	118	97.8	66.0	178	147.6	99.5	238	197.3	133.1	298
59	48.9	33.0	119	98.7	66.5	179	148.4	100.1	239	198.1	133.6	299
60	49.7	33.6	120	99.5	67.1	180	149.2	100.7	240	199.0	134.2	300
Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist

For 56 Degr

TABLE II.

Difference of Latitude and Departure for 35 Degrees.

Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.
1	00.8	00.6	61	50.0	35.0	121	99.1	69.4	181	148.3	103.8	241	197.4	138.2
2	01.6	01.1	62	50.8	35.6	122	99.9	70.0	182	149.1	104.4	242	198.2	138.8
3	02.5	01.7	63	51.6	36.1	123	100.8	70.5	183	149.9	105.0	243	199.1	139.4
4	03.3	02.3	64	52.4	36.7	124	101.6	71.1	184	150.7	105.5	244	199.9	140.0
5	04.1	02.9	65	53.2	37.3	125	102.4	71.7	185	151.5	106.1	245	200.7	140.5
6	04.9	03.4	66	54.1	37.9	126	103.2	72.3	186	152.4	106.7	246	201.5	141.1
7	05.7	04.0	67	54.9	38.4	127	104.6	72.8	187	153.2	107.3	247	202.3	141.7
8	06.6	04.6	68	55.7	39.0	128	104.9	73.4	188	154.0	107.8	248	203.1	142.2
9	07.4	05.2	69	56.5	39.6	129	105.7	74.0	189	154.8	108.4	249	204.0	142.8
10	08.2	05.7	70	57.3	40.2	130	106.5	74·6	190	155.6	109.0	250	204.8	143.4
11	09.0	06.3	71	58.2	40.7	131	107.3	75.1	191	156.5	109.6	251	205.6	144.0
12	09.8	06.9	72	59.0	41.3	132	108.1	75.7	192	157.3	110.1	252	206.4	144.5
13	10.6	07.5	73	59.8	41.9	133	108.9	76.3	193	158.1	110.7	253	207.2	145.1
14	11.5	08.0	74	60.6	42.4	134	109.8	76.9	194	158.9	111.3	254	208.1	145.7
15	12.3	08.6	75	61.4	43.0	135	110.6	77.4	195	159.7	111.8	255	208.9	146.3
16	13.1	09.2	76	62.3	43.6	136	111.4	78.0	196	160.6	112.4	256	209.7	146.8
17	13.9	09.8	77	63.1	44.2	137	112.2	78.6	197	161.4	113.0	257	210.5	147.4
18	14.7	10.3	78	63.9	44.7	138	113.0	79.2	198	162.2	113.6	258	211.3	148.0
19	15.6	10.9	79	64.7	45.3	139	113.9	79.7	199	163.0	114.1	259	212.2	148.6
20	16.4	11.5	80	65.5	45.9	140	114.7	80.3	200	163.8	114.7	260	213.0	149.1
21	17.2	12.0	81	66.4	46.5	141	115.5	80.9	201	164.6	115.3	261	213.8	149.7
22	18.0	12.6	82	67.2	47.0	142	116.3	81.4	202	165.5	115.9	262	214.6	150.3
23	18.8	13.2	83	68.0	47.6	143	117.1	82.0	203	166.3	116.4	263	215.4	150.9
24	19.7	13.8	84	68.8	48.2	144	118.0	82.6	204	167.1	117.0	264	216.3	151.4
25	20.5	14.3	85	69.6	48.8	145	118.8	83.2	205	167.9	117.6	265	217.1	152.0
26	21.3	14.9	86	70.4	49.3	146	119.6	83.7	206	168.7	118.2	266	217.9	152.6
27	22.1	15.5	87	71.3	49.9	147	120.4	84.3	207	169.6	118.7	267	218.7	153.1
28	22.9	16.1	88	72.1	50.5	148	121.2	84.9	208	170.4	119.3	268	219.5	153.7
29	23.8	16.6	89	72.9	51.0	149	122.1	85.5	209	171.2	119.9	269	220.4	154.3
30	24.6	17.2	90	73.7	51.6	150	122.9	86.0	210	172.0	120.5	270	221.2	154.9
31	25.4	17.8	91	74.5	52.2	151	123.7	86.6	211	172.8	121.0	271	222.0	155.4
32	26.2	18.4	92	75.4	52.8	152	124.5	87.2	212	173.7	121.6	272	222.8	156.0
33	27.0	18.9	93	76.2	53.3	153	125.3	87.8	213	174.5	122.2	273	223.6	156.6
34	27.9	19.5	94	77.0	53.9	154	126.1	88.3	214	175.3	122.7	274	224.4	157.2
35	28.7	20.1	95	77.8	54.5	155	127.0	88.9	215	176.1	123.3	275	225.3	157.7
36	29.5	20.6	96	78.6	55.1	156	127.8	89.5	216	176.9	123.9	276	226.1	158.3
37	30.3	21.2	97	79.5	55.6	157	128.6	90.1	217	177.8	124.5	277	226.9	158.9
38	31.1	21.8	98	80.3	56.2	158	129.4	90.6	218	178.6	125.0	278	227.7	159.5
39	31.9	22.4	99	81.1	56.8	159	130.2	91.2	219	179.4	125.6	279	228.5	160.0
40	32.8	22.9	100	81.9	57.4	160	131.1	91.8	220	180.2	126.2	280	229.4	160.6
41	33.6	23.5	101	82.7	57.9	161	131.9	92.3	221	181.0	126.8	281	230.2	161.2
42	34.4	24.1	102	83.6	58.5	162	132.7	92.9	222	181.9	127.3	282	231.0	161.7
43	35.2	24.7	103	84.4	59.1	163	133.5	93.5	223	182.7	127.9	283	231.8	162.3
44	36.0	25.2	104	85.2	59.7	164	134.3	94.1	224	183.5	128.5	284	232.6	162.9
45	36.9	25.8	105	86.0	60.2	165	135.2	94.6	225	184.3	129.1	285	233.5	163.5
46	37.7	26.4	106	86.8	60.8	166	136.0	95.2	226	185.1	129.6	286	234.3	164.0
47	38.5	27.0	107	87.6	61.4	167	136.8	95.8	227	185.9	130.2	287	235.1	164.6
48	39.3	27.5	108	88.5	61.9	168	137.6	96.4	228	186.8	130.8	288	235.9	165.2
49	40.1	28.1	109	89.3	62.5	169	138.4	96.9	229	187.6	131.3	289	236.7	165.8
50	41.0	28.7	110	90.1	63.1	170	139.3	97.5	230	188.4	131.9	290	337.6	166.3
51	41.8	29.3	111	90.9	63.7	171	140.1	98.1	231	189.2	132.5	291	238.4	166.9
52	42.6	29.8	112	91.7	64.2	172	140.9	98.7	232	190.0	133.1	292	239.2	167.5
53	43.4	30.4	113	92.6	64.8	173	141.7	99.2	233	190.9	133.6	293	240.0	168.9
54	44.2	31.0	114	93.4	65.4	174	142.5	99.8	234	191.7	134.2	294	240.8	168.6
55	45.1	31.5	115	94.2	66.0	175	143.4	100.4	235	192.5	134.8	295	241.6	169.2
56	45.9	32.1	116	95.0	66.5	176	144.2	100.9	236	193.3	135.4	296	242.5	169.8
57	46.7	32.7	117	95.8	67.1	177	145.0	101.5	237	194.1	135.9	297	243.3	170.4
58	47.5	33.3	118	96.7	67.7	178	145.8	102.1	238	195.0	136.5	298	244.1	170.9
59	48.3	33.8	119	97.5	68.3	179	146.6	102.7	239	195.8	137.1	299	244.9	171.5
60	49.1	34.4	220	98.3	68.8	180	147.4	103.2	240	196.6	137.7	300	245.7	172.1
Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.

For 55 Degrees.

TABLE II.

Difference of Latitude and Departure for 36 Degrees.

Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.
1	00.8	00.6	61	49.4	35.9	121	97.9	71.1	181	146.4	106.4	241	195.0	141.7
2	01.6	01.2	62	50.2	36.4	122	98.7	71.7	182	147.2	107.0	242	195.8	142.2
3	02.4	01.8	63	51.0	37.0	123	99.5	72.3	183	148.1	107.6	243	196.6	142.8
4	03.2	02.4	64	51.8	37.6	124	100.3	72.9	184	148.9	108.2	244	197.4	143.4
5	04.0	02.9	65	52.6	38.2	125	101.1	73.5	185	149.7	108.7	245	198.2	144.0
6	04.9	03.5	66	53.4	38.8	126	101.9	74.1	186	150.5	109.3	246	199.0	144.6
7	05.7	04.1	67	54.2	39.4	127	102.7	74.6	187	151.3	109.9	247	199.8	145.2
8	06.5	04.7	68	55.0	40.0	128	103.6	75.2	188	152.1	110.5	248	200.6	145.8
9	07.3	05.3	69	55.8	40.6	129	104.4	75.8	189	152.9	111.1	249	201.4	146.4
10	08.1	05.9	70	56.6	41.1	130	105.2	76.4	190	153.7	111.7	250	202.3	146.9
11	08.9	06.5	71	57.4	41.7	131	106.0	77.0	191	154.5	112.3	251	203.1	147.5
12	09.7	07.1	72	58.2	42.3	132	106.8	77.6	192	155.3	112.9	252	203.9	148.1
13	10.5	07.6	73	59.1	42.9	133	107.6	78.2	193	156.1	113.4	253	204.7	148.7
14	11.3	08.2	74	59.9	43.5	134	108.4	78.8	194	156.9	114.0	254	205.5	149.3
15	12.1	08.8	75	60.7	44.1	135	109.2	79.4	195	157.8	114.6	255	206.3	149.9
16	12.9	09.4	76	61.5	44.7	136	110.0	79.9	196	158.6	115.2	256	207.1	150.5
17	13.8	10.0	77	62.3	45.3	137	110.8	80.5	197	159.4	115.8	257	207.9	151.1
18	14.6	10.6	78	63.1	45.8	138	111.6	81.1	198	160.2	116.4	258	208.7	151.6
19	15.4	11.2	79	63.9	46.4	139	112.5	81.7	199	161.0	117.0	259	209.5	152.2
20	16.2	11.8	80	64.7	47.0	140	113.3	82.3	200	161.8	117.6	260	210.3	152.8
21	17.0	12.3	81	65.5	47.6	141	114.1	82.9	201	162.6	118.1	261	211.2	153.4
22	17.8	12.9	82	66.3	48.2	142	114.9	83.5	202	163.4	118.7	262	212.0	154.0
23	18.6	13.5	83	67.1	48.8	143	115.7	84.1	203	164.2	119.3	263	212.8	154.6
24	19.4	14.1	84	68.0	49.4	144	116.5	84.6	204	165.0	119.9	264	213.6	155.2
25	20.2	14.7	85	68.8	50.0	145	117.3	85.2	205	165.8	120.5	265	214.4	155.8
26	21.0	15,3	86	69.6	50.5	146	118.1	85.8	206	166.7	121.1	266	215.2	156.4
27	21.8	15.9	87	70.4	51.1	147	118.9	86.4	207	167.5	121.7	267	216.0	156.9
28	22.7	16.5	88	71.2	51.7	148	119.7	87.0	208	168.3	122.3	268	216.8	157.5
29	23.5	17.0	89	72.0	52.3	149	120.5	87.6	209	169.1	122.8	269	217.6	158.1
30	24.3	17.6	90	72.8	52.9	150	121.4	88.2	210	169.9	123.4	270	218.4	158.7
31	25.1	18.2	91	73.6	53.5	151	122.2	88.8	211	170.7	124.0	271	219.2	159.3
32	25.9	18.8	92	74.4	54.1	152	123.0	89.3	212	171.5	124.6	272	220.1	159.9
33	26.7	19.4	93	75.2	54.7	153	123.8	89.9	213	172.3	125.2	273	220.9	160.5
34	27.5	20.0	94	76.0	55.3	154	124.6	90.5	214	173.1	125.8	274	221.7	161.1
35	28.3	20.6	95	76.9	55.8	155	125.4	91.1	215	173.9	126.4	275	222.5	161.6
36	29.1	21.2	96	77.7	56.4	156	126.2	91.7	216	174.7	127.0	276	223.3	162.2
37	29.9	21.7	97	78.5	57.0	157	127.0	92.3	217	175.6	127.5	277	224.1	162.8
38	30.7	22.3	98	79.3	57.6	158	127.8	92.9	218	176.4	128.1	278	224.9	163.4
39	31.6	22.9	99	80.1	58.2	159	128.6	93.5	219	177.2	128.7	279	225.7	164.0
40	32.4	23.5	100	80.9	58.8	160	129.4	94.0	220	178.0	129.3	280	226.5	164.6
41	33.2	24.1	101	81.7	59.4	161	130.3	94.6	221	178.8	129.9	281	227.3	165.2
42	34·0	24.7	102	82.5	60.0	162	131.1	95.2	222	179.6	130.5	282	228.1	165.8
43	34.8	25.3	103	83.3	60.5	163	131.9	95.8	223	180.4	131.1	283	229.0	166.3
44	35.6	25.9	104	84.1	61.1	164	132.7	96.4	224	181.2	131.7	284	229.8	166.9
45	36.4	26.5	105	84.9	61.7	165	133.5	97.0	225	182.0	132.3	285	230.6	167.5
46	37.2	27.0	106	85.8	62.3	166	134.3	97.6	226	182.8	132.8	286	231.4	168.1
47	38.0	27.6	107	86.6	62.9	167	135.1	98.2	227	183.6	133.4	287	232.2	168.7
48	38.8	28.2	108	87.4	63.5	168	135.9	98.7	228	184.5	134.0	288	233.0	169.3
49	39.6	28.8	109	88.2	64.1	169	136.7	99.3	229	185.3	134.6	289	233.8	169.9
50	40.5	29.4	110	89.0	64.7	170	137.5	99.9	230	186.1	135.2	290	234.6	170.5
51	41.3	30.0	111	89.8	65.2	171	138.3	100.5	231	186.9	135.8	291	235.4	171.0
52	42.1	30.6	112	90.6	65.8	172	139.2	101.1	232	187.7	136.4	292	236.2	171.6
53	42.9	31.2	113	91.4	66.4	173	140.0	101.7	233	188.5	137.0	293	237.0	172.2
54	43.7	31.7	114	92.2	67.0	174	140.8	102.3	234	189.3	137.5	294	237.9	172.8
55	44.5	32.3	115	93.0	67.6	175	141.6	102.9	235	190.1	138.1	295	238.7	173.4
56	45.3	32.9	116	93.8	68.2	176	142.4	103.5	236	190.9	138.7	296	239.5	174.0
57	46.1	33.5	117	94.7	68.8	177	143.2	104.0	237	191.7	139.3	297	240.3	174.6
58	46.9	34.1	118	95.5	69.4	178	144.0	104.6	238	192.5	139.9	298	241.1	175.2
59	47.7	34.7	119	96.3	69.9	179	144.8	105.2	239	193.4	140.5	299	241.9	175.7
60	48.5	35.3	120	97.1	70.5	180	145.6	105.8	240	194.2	141.1	300	242.7	176.3
Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat	Dist	Dep.	Lat.

For 54 Degrees.

TABLE II.

Difference of Latitude and Departure for 37 Degrees.

Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.
1	00.8	00.6	61	48.7	36.7	121	96.6	72.8	181	144.6	108.9	241	192.5	145.0
2	01.6	01.2	62	49.5	37.3	122	97.4	73.4	182	145.4	109.5	242	193.3	145.6
3	02.4	01.8	63	50.3	37.9	123	98.2	74.0	183	146.2	110.1	243	194.1	146.2
4	03.2	02.4	64	51.1	38.5	124	99.0	74.6	184	146.9	110.7	244	194.9	146.8
5	04.0	03.0	65	51.9	39.1	125	99.8	75.2	185	147.7	111.3	245	195.7	147.4
6	04.8	03.6	66	52.7	39.7	126	100.6	75.8	186	148.5	111.9	246	196.5	148.0
7	05.6	04.2	67	53.5	40.3	127	101.4	76.4	187	149.3	112.5	247	197.3	148.6
8	06.4	04.8	68	54.3	40.9	128	102.2	77.0	188	150.1	113.1	248	198.1	149.3
9	07.2	05.4	69	55.1	41.5	129	103.0	77.6	189	150.9	113.7	249	198.9	149.9
10	08.0	06.0	70	55.9	42.1	130	103.8	78.2	190	151.7	114.3	250	199.7	150.5
11	08.8	06.6	71	56.7	42.7	131	104.6	78.8	191	152.5	114.9	251	200.5	151.1
12	09.6	07.2	72	57.5	43.3	132	105.4	79.4	192	153.3	115.5	252	201.3	151.7
13	10.4	07.8	73	58.3	43.9	133	106.2	80.0	193	154.1	116.2	253	202.1	152.3
14	11.2	08.4	74	59.1	44.5	134	107.0	80.6	194	154.9	116.8	254	202.9	152.9
15	12.0	09.0	75	59.9	45.1	135	107.8	81.2	195	155.7	117.4	255	203.7	153.5
16	12.8	09.6	76	60.7	45.7	136	108.6	81.8	196	156.5	118.0	256	204.5	154.1
17	13.6	10.2	77	61.5	46.3	137	109.4	82.4	197	157.3	118.6	257	205.2	154.7
18	14.4	10.8	78	62.3	46.9	138	110.2	83.1	198	158.1	119.2	258	206.0	155.3
19	15.2	11.4	79	63.1	47.5	139	111.0	83.7	199	158.9	119.8	259	206.8	155.9
20	16.0	12.0	80	63.9	48.1	140	111.8	84.3	200	159.7	120.4	260	207.6	156.5
21	16.8	12.6	81	64.7	48.7	141	112.6	84.9	201	160.5	121.0	261	208.4	157.1
22	17.6	13.2	82	65.5	49.3	142	113.4	85.5	202	161.3	121.6	262	209.2	157.7
23	18.4	13.8	83	66.3	50.0	143	114.2	86.1	203	162.1	122.2	263	210.0	158.3
24	19.2	14.4	84	67.1	50.6	144	115.0	86.7	204	162.9	122.8	264	210.8	158.9
25	20.0	15.0	85	67.9	51.2	145	115.8	87.3	205	163.7	123.4	265	211.6	159.5
26	20.8	15.6	86	68.7	51.8	146	116.6	87.9	206	164.5	124.0	266	212.4	160.1
27	21.6	16.2	87	69.5	52.4	147	117.4	88.5	207	165.3	124.6	267	213.2	160.7
28	22.4	16.9	88	70.3	53.0	148	118.2	89.1	208	166.1	125.2	268	214.0	161.3
29	23.2	17.5	89	71.1	53.6	149	119.0	89.7	209	166.9	125.8	269	214.8	161.9
30	24.0	18.1	90	71.9	54.2	150	119.8	90.3	210	167.7	126.4	270	215.6	162.5
31	24.8	18.7	91	72.7	54.8	151	120.6	90.9	211	168.5	127.0	271	216.4	163.1
32	25.6	19.3	92	73.5	55.4	152	121.4	91.5	212	169.3	127.6	272	217.2	163.7
33	26.4	19.9	93	74.3	56.0	153	122.2	92.1	213	170.1	128.2	273	218.0	164.3
34	27.2	20.5	94	75.1	56.6	154	123.0	92.7	214	170.9	128.8	274	218.8	164.9
35	28.0	21.1	95	75.9	57.2	155	123.8	93.3	215	171.7	129.4	275	219.6	165.5
36	28.8	21.7	96	76.7	57.8	156	124.6	93.9	216	172.5	130.0	276	220.4	166.1
37	29.5	22.3	97	77.5	58.4	157	125.4	94.5	217	173.3	130.6	277	221.2	166.7
38	30.3	22.9	98	78.3	59.0	158	126.2	95.1	218	174.1	131.2	278	222.0	167.3
39	31.1	23.5	99	79.1	59.6	159	127.0	95.7	219	174.9	131.8	279	222.8	167.9
40	31.9	24.1	100	79.9	60.2	160	127.8	96.3	220	175.7	132.4	280	223.6	168.5
41	32.7	24.7	101	80.7	60.8	161	128.6	96.9	221	176.5	133.0	281	224.4	169.1
42	33.5	25.3	102	81.5	61.4	162	129.4	97.5	222	177.3	133.6	282	225.2	169.7
43	34.3	25.9	103	82.3	62.0	163	130.2	98.1	223	178.1	134.2	283	226.0	170.3
44	35.1	26.5	104	83.1	62.6	164	131.0	98.7	224	178.9	134.8	284	226.8	170.9
45	35.9	27.1	105	83.9	63.2	165	131.8	99.3	225	179.7	135.4	285	227.6	171.5
46	36.7	27.7	106	84.7	63.8	166	132.6	99.9	226	180.5	136.0	286	228.4	172.1
47	37.5	28.3	107	85.5	64.4	167	133.4	100.5	227	181.3	136.6	287	229.2	172.7
48	38.3	28.9	108	86.3	65.0	168	134.2	101.1	228	182.1	137.2	288	230.0	173.3
49	39.1	29.5	109	87.1	65.6	169	135.0	101.7	229	182.9	137.8	289	230.8	173.7
50	39.9	30.1	110	87.8	66.2	170	135.8	102.3	230	183.7	138.4	290	231.6	174.5
51	40.7	30.7	111	88.6	66.8	171	136.6	102.9	231	184.5	139.0	291	232.4	175.1
52	41.5	31.3	112	89.4	67.4	172	137.4	103.5	232	185.3	139.6	292	233.2	175.7
53	42.3	31.9	113	90.2	68.0	173	138.2	104.1	233	186.1	140.2	293	234.0	176.3
54	43.1	32.5	114	91.0	68.6	174	139.0	104.7	234	186.9	140.8	294	234.8	176.9
55	43.9	33.1	115	91.8	69.2	175	139.8	105.3	235	187.7	141.4	295	235.6	177.5
56	44.7	33.7	116	92.6	69.8	176	140.6	105.9	236	188.5	142.0	296	236.4	178.1
57	45.5	34.3	117	93.4	70.4	177	141.4	106.5	237	189.3	142.6	297	237.2	178.7
58	46.3	34.9	118	94.2	71.0	178	142.2	107.1	238	190.1	143.2	298	238.0	179.3
59	47.1	35.5	119	95.0	71.6	179	143.0	107.7	239	190.9	143.3	299	238.8	179.9
60	47.9	36.1	120	95.8	72.2	180	143.8	108.3	240	191.7	144.4	300	239.6	180.5
Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.

For 53 Degrees.

TABLE II.

Difference of Latitude and Departure for 38 Degrees.

Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.
1	00.8	00.6	61	48.1	37.6	121	95.3	74.5	181	142.6	111.4	241	189.9	148.4
2	01.6	01.2	62	48.9	38.2	122	96.1	75.1	182	143.4	112.1	242	190.7	149.0
3	02.4	01.8	63	49.6	38.8	123	96.9	75.7	183	144.2	112.7	243	191.5	149.6
4	03.2	02.5	64	50.4	39.4	124	97.7	76.3	184	145.0	113.3	244	192.3	150.2
5	03.9	03.1	65	51.2	40.0	125	98.5	77.0	185	145.8	113.9	245	193.1	150.8
6	04.7	03.7	66	52.0	40.6	126	99.3	77.6	186	146.6	114.5	246	193.9	151.5
7	05.5	04.3	67	52.8	41.2	127	100.1	78.2	187	147.4	115.1	247	194.6	152.1
8	06.3	04.9	68	53.6	41.9	128	100.9	78.8	188	148.1	115.7	248	195.4	152.7
9	07.1	05.5	69	54.4	42.5	129	101.7	79.4	189	148.9	116.4	249	196.2	153.3
10	07.9	06.2	70	55.2	43.1	130	102.4	80.0	190	149.7	117.0	250	197.0	153.9
11	08.7	06.8	71	55.9	43.7	131	103.2	80.7	191	150.5	117.6	251	197.8	154.5
12	09.5	07.4	72	56.7	44 3	132	104.0	81.8	192	151.3	118.2	252	198.6	155.1
13	10.2	08.0	73	57.5	44.9	133	104.8	81.9	193	152.1	118.8	253	199.4	155.8
14	11.0	08.6	74	58.3	45.6	134	105.6	82.5	194	152.9	119.4	254	200.2	156.4
15	11.8	09.2	75	59 1	46.2	135	106.4	83.1	195	153.7	120.1	255	200.9	157.0
16	12.6	09.9	76	59.9	46.8	136	107.2	83.7	196	154.5	120.7	256	201.7	157.6
17	13.4	10.5	77	60.7	47 4	137	108.0	84.3	197	155.2	121.3	257	202.5	158.2
18	14.2	11.1	78	61.5	48.0	138	108.7	85.0	198	156.0	121.9	258	203.3	158.8
19	15.0	11.7	79	62.3	48.6	139	109.5	85.6	199	156.8	122.5	259	204.1	159.5
20	15.8	12.3	80	63.0	49.3	140	110.3	86 2	200	157.6	123.1	260	204.9	160.1
21	16.5	12.9	81	63.8	49.9	141	111 1	86.8	201	158.4	123.7	261	205.7	160.7
22	17.3	13.5	82	64.6	50.5	142	111.9	87.4	202	159.2	124.4	262	206.5	161.3
23	18.1	14.2	83	65.4	51.1	143	112.7	88.0	203	160.0	125.0	263	207.2	161.9
24	18.9	14.8	84	66.2	51.7	144	113.5	88.7	204	160.8	125.6	264	208.0	162.5
25	19.7	15.4	85	67.0	52.3	145	114.3	89.3	205	161.5	126.2	265	208.8	163.2
26	20.5	16.0	86	67.8	52.9	146	115.0	89.9	206	162.3	126.8	266	209.6	163.8
27	21.3	16.6	87	68.6	53.6	147	115.8	90.5	207	163.1	127.4	267	210.4	164.4
28	22.1	17.2	88	69.3	54.2	148	116.6	91.1	208	163.9	128.1	268	211.2	165.0
29	22.9	17.9	89	70.1	54.8	149	117.4	91.7	209	164.7	128.7	269	212.0	165.6
30	23.6	18.5	90	70.9	55.4	150	118.2	92.3	210	165.5	129.3	270	212.8	166.2
31	24.4	19.1	91	71.7	56.0	151	119.0	93.0	211	166.3	129.9	271	213.6	166.8
32	25.2	19.7	92	72.5	56.6	152	119.8	93.6	212	167.1	130.5	272	214.3	167.5
33	26.0	20.3	93	73.3	57.3	153	120.6	94.2	213	167.8	131.1	273	215.1	168.1
34	26.8	20.9	94	74.1	57.9	154	121.4	94.8	214	168.6	131.8	274	215.9	168.7
35	27.6	21.5	95	74.9	58.5	155	122.1	95.4	215	169.4	132.4	275	216.7	169.3
36	28.4	22.2	96	75.6	59.1	156	122.9	96.0	216	170.2	133.0	276	217.5	169.9
37	29.2	22.8	97	76.4	59.7	157	123.7	96.7	217	171.0	133.6	277	218.3	170.5
38	29.9	23.4	98	77.2	60.3	158	124.5	97.3	218	171.8	134.2	278	219.1	171.2
39	30.7	24.0	99	78.0	61.0	159	125.3	97.9	219	172.6	134.8	279	219.9	171.8
40	31.5	24.6	100	78.8	61.6	160	126.1	98.5	220	173.4	135.4	280	220.6	172.4
41	32.3	25.2	101	79.6	62.2	161	126.9	99.1	221	174.2	136.1	281	221.4	173.0
42	33.1	25.9	102	80.4	62.8	162	127.7	99.7	222	174.9	136.7	282	222.2	173.6
43	33.9	26.5	103	81.2	63.4	163	128.4	100.4	223	175.7	137.3	283	223.0	174.2
44	34.7	27.1	104	82.0	64.0	164	129.2	101.0	224	176.5	137.9	284	223.8	174.8
45	35.5	27.7	105	82.7	64.6	165	130.0	101.6	225	177.3	138.5	285	224.6	175.5
46	36.2	28.3	106	83.5	65.3	166	130.8	102.2	226	178.1	139.1	286	225.4	176.1
47	37.0	28.9	107	84.3	65.9	167	131.6	102.8	227	178.9	139.8	287	226.2	176.7
48	37.8	29.6	108	85.1	66.5	168	132.4	103.4	228	179.7	140.4	288	226.9	177.3
49	38.6	30.2	109	85.9	67.1	169	133.2	104.0	229	180.5	141.0	289	227.7	177.9
50	39.4	30.8	110	86.7	67.7	170	134.0	104.7	230	181.2	141.6	290	228.5	178.5
51	40.2	31.4	111	87.5	68.3	171	134.7	105.3	231	182.0	142.2	291	229.3	179.2
52	41.0	32.0	112	88.3	69.0	172	135.5	105.9	232	182 8	142.8	292	230.1	179.8
53	41.8	32.6	113	89.0	69.6	173	136.3	106.5	233	183.6	143.4	293	230.9	180.4
54	42.6	33.2	114	89.8	70.2	174	137.1	107.1	234	184.4	144.1	294	231.7	181.0
55	43.3	33.9	115	90.6	70.8	175	137.9	107.7	235	185.2	144.7	295	232.5	181.6
56	44.1	34.5	116	91.4	71.4	176	138.7	108.4	236	186.0	145.3	296	233.3	182.2
57	44.9	35.1	117	92.2	72.0	177	139.5	109.0	237	186.8	145.9	297	234.0	182.9
58	45.7	35.7	118	93.0	72.6	178	140.3	109.6	238	187.5	146.5	298	234.8	183.5
59	46.5	36.3	119	93.8	73.3	179	141.1	110.2	239	188.3	147.1	299	235.6	184.1
60	47.3	36.9	120	94.6	73.9	180	141.8	110.8	240	189.1	147.8	300	236.4	184.7
Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.

For 52 Degrees.

TABLE II.

Difference of Latitude and Departure for 39 Degrees.

Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.
1	00.8	00.6	61	47.4	38.4	121	94.0	76.1	181	140.7	113.9	241	187.3	151.7
2	01.6	01.3	62	48.2	39.0	122	94.8	76.8	182	141.4	114.5	242	188.1	152.3
3	02.3	01.9	63	49.0	39.6	123	95.6	77.4	183	142.2	115.2	243	188.8	152.9
4	03.1	02.5	64	49.7	40.3	124	96.4	78.0	184	143.0	115.8	244	189.6	153.6
5	03.9	03.1	65	50.5	40.9	125	97.1	78.7	185	143.8	116.4	245	190.4	154.2
6	04.7	03.8	66	51.3	41.5	126	97.9	79.3	186	144.5	117.1	246	191.2	154.8
7	05.4	04.4	67	52.1	42.2	127	98.7	79.9	187	145.3	117.7	247	192.0	155.4
8	06.2	05.0	68	52.8	42.8	128	99.5	80.6	188	146.1	118.3	248	192.7	156.1
9	07.0	05.7	69	53.6	43.4	129	100.3	81.2	189	146.9	118.9	249	193.5	156.7
10	07.8	06.3	70	54.4	44.1	130	101.0	81.8	190	147.7	119.6	250	194.3	157.3
11	08.5	06.9	71	55.2	44.7	131	101.8	82.4	191	148.4	120.2	251	195.1	158.0
12	09.3	07.6	72	56.0	45.3	132	102.6	83.1	192	149.2	120.8	252	195.8	158.6
13	10.1	08.2	73	56.7	45.9	133	103.4	83.7	193	150.0	121.5	253	196.6	159.2
14	10.9	08.8	74	57.5	46.6	134	104.1	84.3	194	150.8	122.1	254	197.4	159.8
15	11.7	09.4	75	58.3	47.2	135	104.9	85.0	195	151.5	122.7	255	198.2	160.5
16	12.4	10.1	76	59.1	47.8	136	105.7	85.6	196	152.3	123.3	256	198.9	161.1
17	13.2	10.7	77	59.8	48.5	137	106.5	86.2	197	153.1	124.0	257	199.7	161.7
18	14.0	11.3	78	60.6	49.1	138	107.2	86.8	198	153.9	124.6	258	200.5	162.4
19	14.8	12.0	79	61.4	49.7	139	108.0	87.5	199	154.7	125.2	259	201.3	163.0
20	15.5	12.6	80	62.2	50.3	140	108.8	88.1	200	155.4	125.9	260	202.1	163.6
21	16.3	13.2	81	62.9	51.0	141	109.6	88.7	201	156.2	126.5	261	202.8	164.3
22	17.1	13.8	82	63.7	51.6	142	110.4	89.4	202	157.0	127.1	262	203.6	164.9
23	17.9	14.5	83	64.5	52.2	143	111.1	90.0	203	157.8	127.8	263	204.4	165.5
24	18.7	15.1	84	65.3	52.9	144	111.9	90.6	204	158.5	128.4	264	205.2	166.1
25	19.4	15.7	85	66.1	53.5	145	112.7	91.3	205	159.3	129.0	265	205.9	166.8
26	20.2	16.4	86	66.8	54.1	146	113.5	91.9	206	160.1	129.6	266	206.7	167.4
27	21.0	17.0	87	67.6	54.8	147	114.2	92.5	207	160.9	130.3	267	207.5	168.0
28	21.8	17.6	88	68.4	55.4	148	115.0	93.1	208	161.6	130.9	268	208.3	168.7
29	22.5	18.3	89	69.2	56.0	149	115.8	93.8	209	162.4	131.5	269	209.1	169.3
30	23.3	18.9	90	69.9	56.6	150	116.6	94.4	210	163.2	132.2	270	209.8	169.9
31	24.1	19.5	91	70.7	57.3	151	117.3	95.0	211	164.0	132.8	271	210.6	170.5
32	24.9	20.1	92	71.5	57.9	152	118.1	95.7	212	164.8	133.4	272	211.4	171.2
33	25.6	20.8	93	72.3	58.5	153	118.9	96.3	213	165.5	134.0	273	212.2	171.8
34	26.4	21.4	94	73.1	59.2	154	119.7	96.9	214	166.3	134.7	274	212.9	172.4
35	27.2	22.0	95	73.8	59.8	155	120.5	97.5	215	167.1	135.3	275	213.7	173.1
36	28.0	22.7	96	74.6	60.4	156	121.2	98.2	216	167.9	135.9	276	214.5	173.7
37	28.8	23.3	97	75.4	61.0	157	122.0	98.8	217	168.6	136.6	277	215.3	174.3
38	29.5	23.9	98	76.2	61.7	158	122.8	99.4	218	169.4	137.2	278	216.0	175.0
39	30.3	24.5	99	76.9	62.3	159	123.6	100.1	219	170.2	137.8	279	216.8	175.6
40	31.1	25.2	100	77.7	62.9	160	124.3	100.7	220	171.0	138.5	280	217.6	176.2
41	31.9	25.8	101	78.5	63.6	161	125.1	101.3	221	171.7	139.1	281	218.4	176.8
42	32.6	26.4	102	79.3	64.2	162	125.9	101.9	222	172.5	139.7	282	219.2	177.5
43	33.4	27.1	103	80.0	64.8	163	126.7	102.6	223	173.3	140.3	283	219.9	178.1
44	34.2	27.7	104	80.8	65.4	164	127.5	103.2	224	174.1	141.0	284	220.7	178.7
45	35.0	28.3	105	81.6	66.1	165	128.2	103.8	225	174.9	141.6	285	221.5	179.4
46	35.7	28.9	106	82.4	66.7	166	129.0	104.5	226	175.6	142.2	286	222.3	180.0
47	36.5	29.6	107	83.2	67.3	167	129.8	105.1	227	176.4	142.9	287	223.0	180.6
48	37.3	30.2	108	83.9	68.0	168	130.6	105.7	228	177.2	143.5	288	223.8	181.2
49	38.1	30.8	109	84.7	68.6	169	131.3	106.4	229	178.0	144.1	289	224.6	181.9
50	38.9	31.5	110	85.5	69.2	170	132.1	107.0	230	178.7	144.7	290	225.4	182.5
51	39.6	32.1	111	86.3	69.9	171	132.9	107.6	231	179.5	145.4	291	226.1	183.1
52	40.4	32.7	112	87.0	70.5	172	133.7	108.2	232	180.3	146.0	292	226.9	183.8
53	41.2	33.4	113	87.8	71.1	173	134.4	108.9	233	181.1	146.6	293	227.7	184.4
54	42.0	34.0	114	88.6	71.7	174	135.2	109.5	234	181.9	147.3	294	228.5	185.0
55	42.7	34.6	115	89.4	72.4	175	136.0	110.1	235	182.6	147.9	295	229.3	185.6
56	43.5	35.2	116	90.1	73.6	176	136.8	110.8	236	183.4	148.5	296	230.0	186 3
57	44.3	35.9	117	90.9	73.6	177	137.6	111.4	237	184.2	149.1	297	230.8	186.9
58	45.1	36.5	118	91.7	74.3	178	138.3	112.0	238	185.0	149.8	298	231.6	187.5
59	45.9	37.1	119	92.5	74.9	179	139.1	112.6	239	185.7	150.4	299	232.4	188.2
60	46.6	37.8	120	93.3	75.5	180	139.9	113.3	240	186.5	151.0	300	233.1	188 8
Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.

For 51 Degrees.

TABLE II.

Difference of Latitude and Departure for 40 Degrees.

Dist	Lat.	Dep.	Dist	Lat.	Dep	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.
1	00.8	00.6	61	46.7	39.2	121	92.7	77.8	181	138.7	116.3	241	184.6	154.9
2	01.5	01.3	62	47.5	39.9	122	93.5	78.4	182	139.4	117.0	242	185.4	155.6
3	02.3	01.9	63	48.3	40.5	123	94.2	79.1	183	140.2	117.6	243	186.1	156.2
4	03.1	02.6	64	49.0	41.1	124	95.0	79.7	184	141.0	118.3	244	186.9	156.8
5	03.8	03.2	65	49.8	41.8	125	95.8	80.3	185	141.7	118.9	245	187.7	157.5
6	04.6	03.9	66	50.6	42.4	126	96.5	81.0	186	142.5	119.6	246	108.4	158.1
7	05.4	04.5	67	51.3	43.1	127	97.3	81.6	187	143.3	120.2	247	189.2	158.8
8	06.1	05.1	68	52.1	43.7	128	98.1	82.3	188	144.0	120.8	248	190.0	159.4
9	06.9	05.8	69	52.9	44.4	129	98.8	82.9	189	144.8	121.5	249	190.7	160.1
10	07.7	06.4	70	53.6	45.0	130	99.6	83.6	190	145.5	122.1	250	191.5	160.7
11	08.4	07.1	71	54.4	45.6	131	100.4	84.2	191	146.3	122.8	251	192.3	161.3
12	09.2	07.7	72	55.2	46.3	132	101.1	84.8	192	147.1	123.4	252	193.0	162.0
13	10.0	08.4	73	55.9	46.9	133	101.9	85.5	193	147.8	124.1	253	193.8	162.6
14	10.7	09.0	74	56.7	47.6	134	102.6	86.1	194	148.6	124.7	254	194.6	163.3
15	11.5	09.6	75	57.5	48.2	135	103.4	86.8	195	149.4	125.3	255	195.3	163.9
16	12.3	10.3	76	58.2	48.9	136	104.2	87.4	196	150.1	126.0	256	196.1	164.6
17	13.0	10.9	77	59.0	49.5	137	104.9	88.1	197	150.9	126.6	257	196.9	165.2
18	13.8	11.6	78	59.8	50.1	138	105.7	88.7	198	151.7	127.3	258	197.6	165.8
19	14.6	12.2	79	60.5	50.8	139	106.5	89.3	199	152.4	127.9	259	198.4	166.5
20	15.3	12.9	80	61.3	51.4	140	107.2	90.0	200	153.2	128.6	260	199.2	167.1
21	16.1	13.5	81	62.0	52.1	141	108.0	90.6	201	154.0	129.2	261	199.9	167.8
22	16.9	14.1	82	62.8	52.7	142	108.8	91.3	202	154.7	129.8	262	200.7	168.4
23	17.6	14.8	83	63.6	53.4	143	109.5	91.9	203	155.5	130.5	263	201.5	169.1
24	18.4	15.4	84	64.3	54.0	144	110.3	92.6	204	156.3	131.1	264	202.2	169.7
25	19.2	16.1	85	65.1	54.6	145	111.1	93.2	205	157.0	131.8	265	203.0	170.3
26	19.9	16.7	86	65.9	55.3	146	111.8	93.8	206	157.8	132.4	266	203.8	171.0
27	20.7	17.4	87	66.6	55.9	147	112.6	94.5	207	158.6	133.1	267	204.5	171.6
28	21.4	18.0	88	67.4	56.6	148	113.4	95.1	208	159.3	133.7	268	205.3	172.3
29	22.2	18.6	89	68.2	57.2	149	114.1	95.8	209	160.1	134.3	269	206.1	172.9
30	23.0	19.3	90	68.9	57.9	150	114.9	96.4	210	160.9	135.0	270	206.8	173.6
31	23.7	19.9	91	69.7	58.5	151	115.7	97.1	211	161.6	135.6	271	207.6	174.2
32	24.5	20.6	92	70.5	59.1	152	116.4	97.7	212	162.4	136.3	272	208.4	174.8
33	25.3	21.2	93	71.2	59.8	153	117.2	98.3	213	163.2	136.9	273	209.1	175.5
34	26.0	21.9	94	72.0	60.4	154	118.0	99.0	214	163.9	137.6	274	209.9	176.1
35	26.8	22.5	95	72.8	61.1	155	118.7	99.6	215	164.7	138.2	275	210.7	176.8
36	27.6	23.1	96	73.5	61.7	156	119.5	100.3	216	165.5	138.8	276	211.4	177.4
37	28.3	23.8	97	74.3	62.4	157	120.3	100.9	217	166.2	139.5	277	212.2	178.1
38	29.1	24.4	98	75.1	63.0	158	121.0	101.6	218	167.0	140.1	278	213.0	178.7
39	29.9	25.1	99	75.8	63.6	159	121.8	102.2	219	167.8	140.8	279	213.7	179.3
40	30.6	25.7	100	76.6	64.3	160	122.6	102.8	220	168.5	141.4	280	214.5	180.0
41	31.4	26.4	101	77.4	64.9	161	123.3	103.5	221	169.3	142.1	281	215.3	180.6
42	32.2	27.0	102	78.1	65.6	162	124.1	104.1	222	170.1	142.7	282	216.0	181.3
43	32.9	27.6	103	78.9	66.2	163	124.9	104.8	223	170.8	143.3	283	216.8	181.9
44	33.7	28.3	104	79.7	66.8	164	125.6	105.4	224	171.6	144.0	284	217.6	182.6
45	34.5	28.9	105	80.4	67.5	165	126.4	106.1	225	172.4	144.6	285	218.3	183.2
46	35.2	29.6	106	81.2	68.1	166	127.2	106.7	226	173.1	145.3	286	219.1	183.8
47	36.0	30.2	107	82.0	68.8	167	127.9	107.3	227	173.9	145.9	287	219.9	184.5
48	36.8	30.9	108	82.7	69.4	168	128.7	108.0	228	174.7	146.6	288	220.6	185.1
49	37.5	31.5	109	83.5	70.1	169	129.5	108.6	229	175.4	147.2	289	221.4	185.8
50	38.3	32.1	110	84.3	70.7	170	130.2	109.3	230	176.2	147.8	290	222.2	186.4
51	39.1	32.8	111	85.0	71.3	171	131.0	109.9	231	177.0	148.5	291	222.9	187.1
52	39.8	33.4	112	85.8	72.0	172	131.8	110.6	232	177.7	149.1	292	223.7	187.7
53	40.6	34.1	113	86.6	72.6	173	132.5	111.2	233	178.5	149.8	293	224.5	188.3
54	41.4	34.7	114	87.3	73.3	174	133.3	111.8	234	179.3	150.4	294	225.2	189.0
55	42.1	35.4	115	88.1	73.9	175	134.1	112.5	235	180.0	151.1	295	226.0	189.6
56	42.9	36.0	116	88.9	74.6	176	134.8	113.1	236	180.8	151.7	296	226.7	190.3
57	43.7	36.6	117	89.6	75.2	177	135.6	113.8	237	181.6	152.3	297	227.5	190.9
58	44.4	37.3	118	90.4	75.8	178	136.4	114.4	238	182.3	153.0	298	228.3	191.6
59	45.2	37.9	119	91.2	76.5	179	137.1	115.1	239	183.1	153.6	299	229.0	192.2
60	46.0	38.6	120	91.9	77.1	180	137.9	115.7	240	183.9	154.3	300	229.8	192.8
Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.

For 50 Degrees.

TABLE II.

Difference of Latitude and Departure for 41 Degrees.

Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.
1	00.8	00.7	61	46.0	40.0	121	91.3	79.4	181	136.6	118.7	241	181.9	158.1
2	01.5	01.3	62	46.8	40.7	122	92.1	80.0	182	137.4	119.4	242	182.6	158.8
3	02.3	02.0	63	47.5	41.3	123	92.8	80.7	183	138.1	120.1	243	183.4	159.4
4	03.0	02.6	64	48.3	42.0	124	93.6	81.4	184	138.9	120.7	244	184.1	160.1
5	03.8	03.3	65	49.1	42.6	125	94.3	82.0	185	139.6	121.4	245	184.9	160.7
6	04.5	03.9	66	49.8	43.3	126	95.1	82.7	186	140.4	122.0	246	185.7	161.4
7	05.3	04.6	67	50.6	44.0	127	95.8	83.3	187	141.1	122.7	247	186.4	162.0
8	06.0	05.2	68	51.3	44.6	128	96.6	84.0	188	141.9	123.3	248	187.2	162.7
9	06.8	05.9	69	52.1	45.3	129	97.4	84.6	189	142.6	124.0	249	187.9	163.4
10	07.5	06.6	70	52.8	45.9	130	98.1	85.3	190	143.4	124 7	250	188.7	164.0
11	08.3	07.2	71	53.6	46.6	131	98.9	85.9	191	144.1	125.3	251	189.4	164.7
12	09.1	07.9	72	54.3	47.2	132	99.6	86.6	192	144.9	126.0	252	190.2	165.3
13	09.8	08.5	73	55.1	47.9	133	100.4	87.3	193	145.7	126.6	253	190.9	166.0
14	10.6	09.2	74	55.8	48.5	134	101.1	87.9	194	146.4	127.3	254	191.7	166.6
15	11.3	09.8	75	56.6	49.2	135	101.9	88.6	195	147.2	127.9	255	192.5	167.3
16	12.1	10.5	76	57.4	49.9	136	102.6	89.2	196	147.9	128.6	256	193.2	168.0
17	12.8	11.2	77	58.1	50.5	137	103.4	89.9	197	148.7	129.2	257	194.0	168.6
18	13.6	11.8	78	58.9	51.2	138	104.1	90.5	198	149.4	129.9	258	194.7	169.3
19	14.3	12.5	79	59.6	51.8	139	104.9	91.2	199	150.2	130.6	259	195.5	169.9
20	15.1	13.1	80	60.4	52.5	140	105.7	91.8	200	150.9	131.2	260	196.2	170.6
21	15.8	13.8	81	61.1	53.1	141	106.4	92.5	201	151.7	131.9	261	197.0	171.2
22	16.6	14.4	82	61.9	53.8	142	107.2	93.2	202	152.5	132.5	262	197.7	171.9
23	17.4	15.1	83	62.6	54.5	143	107.9	93.8	203	153.2	133.2	263	198.5	172.5
24	18.1	15.7	84	63.4	55.1	144	108.7	94.5	204	154.0	133.8	264	199.2	173.2
25	18.9	16.4	85	64.2	55.8	145	109.4	95.1	205	154.7	134.5	265	200.0	173.9
26	19.6	17.1	86	64.9	56.4	146	110.2	95.8	206	155.5	135.1	266	200.8	174.5
27	20.4	17.7	87	65.7	57.1	147	110.9	96.4	207	156.2	135.8	267	201.5	175.2
28	21.1	18.4	88	66.4	57.7	148	111.7	97.1	208	157.0	136.5	268	202.3	175.8
29	21.9	19.0	89	67.2	58.4	149	112.5	97.8	209	157.7	137.1	269	203.0	176.5
30	22.6	19.7	90	67.9	59.0	150	113.2	98.4	210	158.5	137.8	270	203.8	177.1
31	23.4	20.3	91	68.7	59.7	151	114.0	99.1	211	159.2	138.4	271	204.5	177.8
32	24.2	21.0	92	69.4	60.4	152	114.7	99.7	212	160.0	139.1	272	205.3	178.4
33	24.9	21.6	93	70.2	61.0	153	115.5	100.4	213	160.8	139.7	273	206.0	179.1
34	25.7	22.3	94	70.9	61.7	154	116.2	101.0	214	161.5	140.4	274	206.8	179.8
35	26.4	23.0	95	71.7	62.3	155	117.0	101.7	215	162.3	141.1	275	207.5	180.4
36	27.2	23.6	96	72.5	63.0	156	117.7	102.3	216	163.0	141.7	276	208.3	181.1
37	27.9	24.3	97	73.2	63.6	157	118.5	103.0	217	163.8	142.4	277	209.1	181.7
38	28.7	24.9	98	74.0	64.3	158	119.2	103.7	218	164.5	143.0	278	209.8	182.4
39	29.4	25.6	99	74.7	64.9	159	120.0	104.3	219	165.3	143.7	279	210.6	183.0
40	30.2	26.2	100	75.5	65.6	160	120.8	105.0	220	166.0	144.3	280	211.3	183.7
41	30.9	26.9	101	76.2	66.3	161	121.5	105.6	221	166.8	145.0	281	212.1	184.4
42	31.7	27.6	102	77.0	66.9	162	122.3	106.3	222	167.5	145.6	282	212.8	185.0
43	32.5	28.2	103	77.7	67.6	163	123.0	106.9	223	168.3	146.3	283	213.6	185.7
44	33.2	28.9	104	78.5	68.2	164	123.8	107.6	224	169.1	147.0	284	214.3	186.3
45	34.0	29.5	105	79.2	68.9	165	124.5	108.2	225	169.8	147.6	285	215.1	187.0
46	34.7	30.2	106	80.0	69.5	166	125.3	108.9	226	170.6	148.3	286	215.8	187.6
47	35.5	30.8	107	80.8	70.2	167	126.0	109.6	227	171.3	148.9	287	216.6	188.3
48	36.2	31.5	108	81.5	70.9	168	126.8	110.2	228	172.1	149.6	288	217.4	188.9
49	37.0	32.1	109	82.3	71.5	169	127.5	110.9	229	172.8	150.2	289	218.1	189.6
50	37.7	32.8	110	83.0	72.2	170	128.3	111.5	230	173.6	150.9	290	218.9	190.3
51	38.5	33.5	111	83.8	72.8	171	129.1	112.2	231	174.3	151.5	291	219.6	190.9
52	39.2	34.1	112	84.5	73.5	172	129.8	112.8	232	175.1	152.2	292	220.4	191.6
53	40.0	34.8	113	85.3	74.1	173	130.6	113.5	233	175.8	152.9	293	221.1	192.2
54	40.8	35.4	114	86.0	74.8	174	131.3	114.2	234	176.6	153.5	294	221.9	192.9
55	41.5	36.1	115	86.8	75.4	175	132.1	114.8	235	177.4	154.2	295	222.6	193.5
56	42.3	36.7	116	87.5	76.1	176	132.8	115.5	236	178.1	154.8	296	223.4	194 2
57	43.0	37.4	117	88.3	76.8	177	133.6	116.1	237	178.9	155.5	297	224.1	194.8
58	43.8	38.1	118	89.1	77.4	178	134.3	116.8	238	179.6	156.1	298	224.9	195.5
59	44.5	38.7	119	89.8	78.1	179	135.1	117.4	239	180.4	156.8	299	225.7	196.2
60	45.3	39.4	120	90.6	78.7	180	135.8	118.1	240	181 1	157.5	300	226.4	196.8
Dist	Dep.	Lat.	Dist	Dep.	Lat	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.

For 49 Degrees.

TABLE II.

Difference of Latitude and Departure for 42 Degrees.

Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.
1	00.7	00.7	61	45.3	40.8	121	89.9	81.0	181	134.5	121.1	241	179.1	161.3
2	01.5	01.3	62	46.1	41.5	122	90.7	81.6	182	135.3	121.8	242	179.8	161.9
3	02.2	02.0	63	46.8	42.2	123	91.4	82.3	183	136.0	122.5	243	180.6	162.6
4	03.0	02.7	64	47.6	42.8	124	92.1	83.0	184	136.7	123.1	244	181.3	163.3
5	03.7	03.3	65	48.3	43.5	125	92.9	83.6	185	137.5	123.8	245	182.1	163.9
6	04.5	04.0	66	49.0	44.2	126	93.6	84.3	186	138.2	124.5	246	182.8	164.6
7	05.2	04.7	67	49.8	44.8	127	94.4	85.0	187	139.0	125.1	247	183.6	165.3
8	05.9	05.4	68	50.5	45.5	128	95.1	85.6	188	139.7	125.8	248	184.3	165.9
9	06.7	06.0	69	51.3	46.2	129	95.9	86.3	189	140.5	126.5	249	185.0	166.6
10	07.4	06.7	70	52.1	46.8	130	96.6	87.0	190	141.2	127.1	250	185.8	167.3
11	08.2	07.4	71	52.8	47.5	131	97.4	87.7	191	141.9	127.8	251	186.5	168.0
12	08.9	08.0	72	53.5	48.2	132	98.1	88.3	192	142.7	128.5	252	187.3	168.6
13	09.7	08.7	73	54.2	48.8	133	98.8	89.0	193	143.4	129.1	253	188.0	169.3
14	10.4	09.4	74	55.0	49.5	134	99.6	89.7	194	144.2	129.8	254	188.8	170.0
15	11.1	10.0	75	55.7	50.2	135	100.3	90.3	195	144.9	130.5	255	189.5	170.6
16	11.9	10.7	76	56.5	50.9	136	101.1	91.0	196	145.7	131.1	256	190.2	171.3
17	12.6	11.4	77	57.2	51.5	137	101.8	91.7	197	146.4	131.8	257	191.0	172.0
18	13.4	12.0	78	58.0	52.2	138	102.6	92.3	198	147.1	132.5	258	191.7	172.6
19	14.1	12.7	79	58.7	52.9	139	103.3	93.0	199	147.9	133.2	259	192.5	173.3
20	14.9	13.4	80	59.5	53.5	140	104.0	93.7	200	148.6	133.8	260	193.2	174.0
21	15.6	14.1	81	60.2	54.2	141	104.8	94.3	201	149.4	134.5	261	194.0	174.6
22	16.3	14.7	82	60.9	54.9	142	105.5	95.0	202	150.1	135.2	262	194.7	175.3
23	17.1	15.4	83	61.7	55.5	143	106.3	95.7	203	150.9	135.8	263	195.4	176.0
24	17.8	16.1	84	62.4	56.2	144	107.0	96.4	204	151.6	136.5	264	196.2	176.7
25	18.6	16.7	85	63.2	56.9	145	107.8	97.0	205	152.3	137.2	265	196.9	177.3
26	19.3	17.4	86	63.9	57.5	146	108.5	97.7	206	153.1	137.8	266	197.7	178.0
27	20.1	18.1	87	64.7	58.2	147	109.2	98.4	207	153.8	138.5	267	198.4	178.7
28	20.8	18.7	88	65.4	58.9	148	110.0	99.0	208	154.6	139.2	268	199.2	179.3
29	21.6	19.4	89	66.1	59.6	149	110.7	99.7	209	155.3	139.8	269	199.9	180.0
30	22.3	20.1	90	66.9	60.2	150	111.5	100.4	210	156.1	140.5	270	200.6	180.7
31	23.0	20.7	91	67.6	60.9	151	112.2	101.0	211	156.8	141.2	271	201.4	181.3
32	23.8	21.4	92	68.4	61.6	152	113.0	101.7	212	157.5	141.9	272	202.1	182.0
33	24.5	22.1	93	69.1	62.2	153	113.7	102.4	213	158.3	142.5	273	202.9	182.7
34	25.3	22.8	94	69.9	62.9	154	114.4	103.0	214	159.0	143.2	274	203.6	183.3
35	26.0	23.4	95	70.6	63.6	155	115.2	103.7	215	159.8	143.9	275	204.4	184.0
36	26.8	24.1	96	71.3	64.2	156	115.9	104.4	216	160.5	144.5	276	205.1	184.7
37	27.5	24.8	97	72.1	64.9	157	116.7	105.1	217	161.3	145.2	277	205.9	185.3
38	28.2	25.4	98	72.8	65.6	158	117.4	105.7	218	162.0	145.9	278	206.6	186.0
39	29.0	26.1	99	73.6	66.2	159	118.2	106.4	219	162.7	146.5	279	207.3	186.7
40	29.7	26.8	100	74.3	66.9	160	118.9	107.1	220	163.5	147.2	280	208.1	187.4
41	30.5	27.4	101	75.1	67.6	161	119.6	107.7	221	164.2	147.9	281	208.8	188.0
42	31.2	28.1	102	75.8	68.3	162	120.4	108.4	222	165.0	148.5	282	209.6	188.7
43	32.0	28.8	103	76.5	68.9	163	121.1	109.1	223	165.7	149.2	283	210.3	189.4
44	32.7	29.4	104	77.3	69.6	164	121.9	109.7	224	166.5	149.9	284	211.1	190.0
45	33.4	30.1	105	78.0	70.3	165	122.6	110.4	225	167.2	150.6	285	211.8	190.7
46	34.2	30.8	106	78.8	70.9	166	123.4	111.1	226	168.0	151.2	286	212.5	191.4
47	34.9	31.4	107	79.5	71.6	167	124.1	111.7	227	168.7	151.9	287	213.3	192.0
48	35.7	32.1	108	80.3	72.3	168	124.8	112.4	228	169.4	152.6	288	214.0	192.7
49	36.4	32.8	109	81.0	72.9	169	125.6	113.1	229	170.2	153.2	289	214.8	193.4
50	37.2	33.5	110	81.7	73.6	170	126.3	113.8	230	170.9	153.9	290	215.5	194.0
51	37.9	34.1	111	82.5	74.3	171	127.1	114.4	231	171.7	154.6	291	216.3	194.7
52	38.6	34.8	112	83.2	74.9	172	127.8	115.1	232	172.4	155.2	292	217.0	195.4
53	39.4	35.5	113	84.0	75.6	173	128.6	115.8	233	173.2	155.9	293	217.7	196.1
54	40.1	36.1	114	84.7	76.3	174	129.3	116.4	234	173.9	156.6	294	218.5	196.7
55	40.9	36.8	115	85.5	77.9	175	130.1	117.1	235	174.6	157.2	295	219.2	197.4
56	41.6	37.5	116	86.2	77.6	176	130.8	117.8	236	175.4	157.9	296	220.0	198.1
57	42.4	38.1	117	86.9	78.3	177	131.5	118.4	237	176.1	158.6	297	220.7	198.7
58	43.1	38.8	118	87.7	79.0	178	132.3	119.1	238	176.9	159.3	298	221.5	199.4
59	43.8	39.5	119	88.4	79.6	179	133.0	119.8	239	177.6	159.9	299	222.2	200.1
60	44.6	40.1	120	89.2	80.3	180	133.8	120.4	240	178.4	160.6	300	222.9	200.7
Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.

For 48 Degrees.

TABLE II.

Difference of Latitude and Departure for 43 Degrees.

Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat	Dep.
1	00.7	00.7	61	44.6	41.6	121	88.5	82.5	181	132.4	123.4	241	176.3	164.4
2	01.5	01.4	62	45.3	42.3	122	89.2	83.2	182	133.1	124.1	242	177.0	165.0
3	02.2	02.0	63	46.1	43.0	123	90.0	83.9	183	133.8	124.8	243	177.7	165.7
4	02.9	02.7	64	46.8	43.6	124	90.7	84.6	184	134.6	125.5	244	178.5	166.4
5	03.7	03.4	65	47.5	44.3	125	91.4	85.2	185	135.3	126.2	245	179.2	167.1
6	04.4	04.1	66	48.3	45.0	126	92.2	85.9	186	136.0	126.9	246	179.9	167.8
7	05.1	04.8	67	49.0	45.7	127	92.9	86.6	187	136.8	127.5	247	180.6	168.5
8	05.9	05.5	68	49.7	46.4	128	93.6	87.3	188	137.5	128.2	248	181.4	169.1
9	06.6	06.1	69	50.5	47.1	129	94.3	88.0	189	138.2	128.9	249	182.1	169.8
10	07.3	06.8	70	51.2	47.7	130	95.1	88.7	190	139.0	129.6	250	182.8	170.5
11	08.0	07.5	71	51.9	48.4	131	95.8	89.3	191	139.7	130.3	251	183.6	171.2
12	08.8	08.2	72	52.7	49.1	132	96.5	90.0	192	140.4	130.9	252	184.3	171.9
13	09.5	08.9	73	53.4	49.8	133	97.3	90.7	193	141.2	131.6	253	185.0	172.5
14	10.2	09.5	74	54.1	50.5	134	98.0	91.4	194	141.9	132.3	254	185.8	173.2
15	11.0	10.2	75	54.9	51.1	135	98.7	92.1	195	142.6	133.0	255	186.5	173.9
16	11.7	10.9	76	55.6	51.8	136	99.5	92.8	196	143.3	133.7	256	187.2	174.6
17	12.4	11.6	77	56.3	52.5	137	100.2	93.4	197	144.1	134.4	257	188.0	175.3
18	13.2	12.3	78	57.0	53.2	138	100.9	94.1	198	144.8	135.0	258	188.7	176.0
19	13.9	13.0	79	57.8	53.9	139	101.7	94.8	199	145.5	135.7	259	189.4	176.6
20	14.6	13.6	80	58.5	54.6	140	102.4	95.5	200	146.3	136.4	260	190.2	177.3
21	15.4	14.3	81	59.2	55.2	141	103.1	96.2	201	147.6	137.1	261	190.9	178.0
22	16.1	15.0	82	60.0	55.9	142	103.9	96.8	202	147.7	137.8	262	191.6	178.7
23	16.8	15.7	83	60.7	56.6	143	104.6	97.5	203	148.5	138.4	263	192.3	179.4
24	17.6	16.4	84	61.4	57.3	144	105.3	98.2	204	149.2	139.1	264	193.1	180.0
25	18.3	17.0	85	62.2	58.0	145	106.0	98.9	205	149.9	139.8	265	193.8	180.7
26	19.0	17.7	86	62.9	58.7	146	106.8	99.6	206	150.7	140.5	266	194.5	181.4
27	19.7	18.4	87	63.6	59.3	147	107.5	100.3	207	151.4	141.2	267	195.3	182.1
28	20.5	19.1	88	64.4	60.0	148	108.2	100.9	208	152.1	141.9	268	196.0	182.8
29	21.2	19.8	89	65.1	60.7	149	109.0	101.6	209	152.9	142.5	269	196.7	183.5
30	21.9	20.5	90	65.8	61.4	150	109.7	102.3	210	153.6	143.2	270	197.5	184.1
31	22.7	21.1	91	66.6	62.1	151	110.4	103.0	211	154.3	143.9	271	198.2	184.8
32	23.4	21.8	92	67.3	62.7	152	111.2	103.7	212	155.0	144.6	272	198.9	185.5
33	24.1	22.5	93	68.0	63.4	153	111.9	104.3	213	155.8	145.3	273	199.7	186.2
34	24.9	23.2	94	68.7	64.1	154	112.6	105.0	214	156.5	145.9	274	200.4	186.9
35	25.6	23.9	95	69.5	64.8	155	113.4	105.7	215	157.2	146.6	275	201.1	187.5
36	26.3	24.6	96	70.2	65.5	156	114.1	106.4	216	158.0	147.3	276	201.9	188.2
37	27.1	25.2	97	70.9	66.2	157	114.8	107.1	217	158.7	148.0	277	202.6	188.9
38	27.8	25.9	98	71.7	66.8	158	115.6	107.8	218	159.4	148.7	278	203.3	189.6
39	28.5	26.6	99	72.4	67.5	159	116.3	108.4	219	160.2	149.4	279	204.0	190.3
40	29.3	27.3	100	73.1	68.2	160	117.0	109.1	220	160.9	150.0	280	204.8	191.0
41	30.0	28.0	101	73.9	68.9	161	117.7	109.8	221	161.6	150.7	281	205.5	191.6
42	30.7	28.6	102	74.6	69.6	162	118.5	110.5	222	162.4	151.4	282	206.2	192.3
43	31.4	29.3	103	75.3	70.2	163	119.2	111.2	223	163.1	152.1	283	207.0	193.0
44	32.2	30.0	104	76.1	70.9	164	119.9	111.8	224	163.8	152.8	284	207.7	193.7
45	32.9	30.7	105	76.8	71.6	165	120.7	112.5	225	164.6	153.4	285	208.4	194.4
46	33.6	31.4	106	77.5	72.3	166	121.4	113.2	226	165.3	154.1	286	209.2	195.1
47	34.4	32.1	107	78.3	73.0	167	122.1	113.9	227	166.0	154.8	287	209.9	195.7
48	35.1	32.7	108	79.0	73.7	168	122.9	114.6	228	166.7	155.5	288	210.6	196.4
49	35.8	33.4	109	79.7	74.3	169	123.6	115.3	229	167.5	156.2	289	211.4	197.1
50	36.6	34.1	110	80.4	75.0	170	124.3	115.9	230	168.2	156.9	290	212.1	197.8
51	37.3	34.8	111	81.2	75.7	171	125.1	116.6	231	168.9	157.5	291	212.8	198.5
52	38.0	35.5	112	81.9	76.4	172	125.8	117.3	232	169.7	158.2	292	213.6	199.1
53	38.8	36.1	113	82.6	77.1	173	126.5	118.0	233	170.4	158.9	293	214.3	199.8
54	39.5	36.8	114	83.4	77.7	174	127.3	118.7	234	171.1	159.6	294	215.0	200.5
55	40.2	37.5	115	84.1	78.4	175	128.0	119.3	235	171.9	160.3	295	215.7	201.2
56	41.0	38.2	116	84.8	79.1	176	128.7	120.0	236	172.6	161.0	296	216.5	201.9
57	41.7	38.9	117	85.6	79.8	177	129.4	120.7	237	173.3	161.6	297	217.2	202.6
58	42.4	39.6	118	86.3	80.5	178	130.2	121.4	238	174.1	162.3	298	217.9	203.2
59	43.1	40.2	119	87.0	81.2	179	130.9	122.1	239	174.8	163.0	299	218.7	203.9
60	43.9	40.9	120	87.8	81.8	180	131.6	122.8	240	175.5	163.7	300	219.4	204.6
Dist	Dep.	Lat.	Dist	Dep	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.

For 47 Degrees.

TABLE II.

Difference of Latitude and Departure for 44 Degrees.

Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.
1	00.7	00.7	61	43.9	42.4	121	87.0	84.1	181	130.2	125.7	241	173.4	167.4
2	01.4	01.4	62	44.6	43.1	122	87.8	84.7	182	130.9	126.4	242	174.1	168.1
3	02.2	02.1	63	45.3	43.8	123	88.5	85.4	183	131.6	127.1	243	174.8	168.8
4	02.9	02.8	64	46.0	44.5	124	89.2	86.1	184	132.4	127.8	244	175.5	169.5
5	03.6	03.5	65	46.8	45.2	125	89.9	86.8	185	133.1	128.5	245	176.2	170.2
6	04.3	04.2	66	47.5	45.8	126	90.6	87.5	186	133.8	129.2	246	177.0	170.9
7	05.0	04.9	67	48.2	46.5	127	91.4	88.2	187	134.5	129.9	247	177.7	171.6
8	05.8	05.6	68	48.9	47.2	128	92.1	88.9	188	135.2	130.6	248	178.4	172.3
9	06.5	06.3	69	49.6	47.9	129	92.8	89.6	189	136.0	131.3	249	179.1	173.0
10	07.2	06.9	70	50.4	48.6	130	93.5	90.3	190	136.7	132.0	250	179.8	173.7
11	07.9	07.6	71	51.1	49.3	131	94.2	91.0	191	137.4	132.7	251	180.6	174.4
12	08.6	08.3	72	51.8	50.0	132	95.0	91.7	192	138.1	133.4	252	181.3	175.1
13	09.4	09.0	73	52.5	50.7	133	95.7	92 4	193	138.8	134.1	253	182.0	175.7
14	10.1	09.7	74	53.2	51.4	134	96.4	93.1	194	139.6	134.8	254	182.7	176.4
15	10.8	10.4	75	54.0	52.1	135	97.1	93.8	195	140.3	135.5	255	183.4	177.1
16	11.5	11.1	76	54.7	52.8	136	97.8	94.5	196	141.0	136.2	256	184.2	177.8
17	12.2	11.8	77	55.4	53.5	137	98.5	95.2	197	141.7	136.8	257	184.9	178.5
18	12.9	12.5	78	56.1	54.2	138	99.3	95.9	198	142.4	137.5	258	185.6	179.2
19	13.7	13.2	79	56.8	54.9	139	100.0	96 6	199	143.1	138.2	259	186.3	179.9
20	14.4	13.9	80	57.5	55.6	140	100.7	97.3	200	143.9	138.9	260	187.0	180.6
21	15.1	14.6	81	58.3	56.3	141	101.4	97.9	201	144.6	139.6	261	187.7	181.3
22	15.8	15.3	82	59.0	57.0	142	102.1	98.6	202	145.3	140.3	262	188.5	182.0
23	16.5	16.0	83	59.7	57.7	143	102.9	99.3	203	146.0	141.0	263	189.2	182.7
24	17.3	16.7	84	60.4	58.4	144	103.6	100.0	204	146.7	141.7	264	189.9	183.4
25	18.0	17.4	85	61.1	59.0	145	104.3	100.7	205	147.5	142.4	265	190.6	184.1
26	18.7	18.1	86	61.9	59.7	146	105.0	101.4	206	148.2	143.1	266	191.3	184.8
27	19.4	18.8	87	62.6	60.4	147	105.7	102.1	207	148.9	143.8	267	192.1	185.5
28	20 1	19.5	88	63.3	61.1	148	106.5	102.8	208	149.6	144.5	268	192.8	186.2
29	20.9	20.1	89	64.0	61.8	149	107.2	103.5	209	150.3	145.2	269	193.5	186.9
30	21 6	20.8	90	64.7	62.5	150	107.9	104.2	210	151.1	145.9	270	194.2	187.6
31	22.3	21.5	91	65.5	63.2	151	108.6	104.9	211	151.8	146.6	271	194.9	188.3
32	23.0	22.2	92	66.2	63.9	152	109.3	105.6	212	152.5	147.3	272	195.7	188.9
33	23.7	22.9	93	66 9	64.6	153	110.1	106.3	213	153.2	148.0	273	196.4	189.6
34	24.5	23.6	94	67.6	65.3	154	110.8	107.0	214	153.9	148.7	274	197.1	190.3
35	25.2	24.3	95	68.3	66.0	155	111.5	107.7	215	154.7	149.4	275	197.8	191.0
36	25.9	25.0	96	69.1	66.7	156	112.2	108.4	216	155.4	150.0	276	198.5	191.7
37	26.6	25.7	97	69.8	67.4	157	112.9	109.1	217	156.1	150.7	277	199.3	192.4
38	27.3	26.4	98	70.5	68.1	158	113.7	109.8	218	156.8	151.4	278	200.0	193.1
39	28.1	27.1	99	71.2	68.8	159	114.4	110.5	219	157.5	152.1	279	200.7	193.8
40	28.8	27.8	100	71.9	69.5	160	115.1	111.1	220	158.3	152.8	280	201.4	194.5
41	29.5	28.5	101	72.7	70.2	161	115.8	111.8	221	159.0	153.5	281	202.1	195.2
42	30.2	29.2	102	73.4	70.9	162	116.5	112.5	222	159.7	154.2	282	202.9	195.9
43	30.9	29.9	103	74.1	71.5	163	117.3	113.2	223	160.4	154.9	283	203.6	196.6
44	31.7	30.6	104	74.8	72.2	164	118.0	113.9	224	161.1	155.6	284	204.3	197.3
45	32.4	31 3	105	75.5	72.9	165	118.7	114.6	225	161 9	156.3	285	205.0	198.0
46	33.1	32.0	106	76.3	73.6	166	119.4	115.3	226	162.6	157.0	286	205.7	198.7
47	33.8	32.6	107	77.0	74.3	167	120.1	116.0	227	163 3	157.7	287	206.5	199.4
48	34.5	33.3	108	77.7	75.0	168	120.8	116.7	228	164.0	158.4	288	207.2	200.1
49	35.2	34.0	109	78.4	75.7	169	121.6	117.4	229	164.7	159.1	289	207.9	200.8
50	36.0	34.7	110	79.1	76.4	170	122.3	118.1	230	165.4	159.8	290	208.6	201.5
51	36.7	35.4	111	79.8	77.1	171	123.0	118.8	231	166.2	160.5	291	209.3	202.1
52	37.4	36.1	112	80.6	77.8	172	123·7	119.5	232	166.9	161.2	292	210.0	202.8
53	38.1	36.8	113	81.3	78.5	173	124.4	120.2	233	167 6	161.9	293	210.8	203.5
54	38.8	37.5	114	82.0	79.2	174	125.2	120.9	234	168.3	162.6	294	211.5	204.2
55	39.6	38.2	115	82.7	79.9	175	125.9	121.6	235	169.0	163.2	295	212.2	204.9
56	40.3	38.9	116	83.4	80.6	176	126.6	122.3	236	169.8	163.9	296	212.9	205.6
57	41.0	39 6	117	84.2	81.3	177	127.3	123.0	237	170.5	164.6	297	213.6	206.3
58	41.7	40.3	118	84.9	82.0	178	128.0	123.6	238	171 2	165.3	298	214.4	207.0
59	42.4	41.0	119	85.6	82.7	179	128.8	124.3	239	171.9	166.0	299	215.1	207.7
60	43.2	41.7	120	86.3	83.4	180	129.5	125.0	240	172.6	166.7	300	215.8	208.4
Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.

For 46 Degrees.

TABLE II.

Difference of Latitude and Departure for 45 Degrees.

Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.	Dist	Lat.	Dep.
1	00.7	00.7	61	43.1	43.1	121	85.6	85.6	181	128.0	128.0	241	170.4	170.4
2	01.4	01.4	62	43.8	43.8	122	86.3	86.3	182	128.7	128.7	242	171.1	171.1
3	02.1	02.1	63	44.5	44.5	123	87.0	87.0	183	129.4	129.4	243	171.8	171.8
4	02.8	02.8	64	45.3	45.3	124	87.7	87.7	184	130.1	130.1	244	172.5	172.5
5	03.5	03.5	65	46.0	46.0	125	88.4	88.4	185	130.8	130.8	245	173.2	173.2
6	04.2	04.2	66	46.7	46.7	126	89.1	89.1	186	131.5	131.5	246	173.9	173.9
7	04.9	04.9	67	47.4	47.4	127	89.8	89.8	187	132.2	132.2	247	174.7	174.7
8	05.7	05.7	68	48.1	48.1	128	90.5	90.5	188	132.9	132.9	248	175.4	175.4
9	06.4	06.4	69	48.8	48.8	129	91.2	91.2	189	133.6	133.6	249	176.1	176.1
10	07.1	07.1	70	49.5	49.5	130	91.9	91.9	190	134.3	134.3	250	176.8	176.8
11	07.8	07.8	71	50.2	50.2	131	92.6	92.6	191	135.1	135.1	251	177.5	177.5
12	08.5	08.5	72	50.9	50.9	132	93.3	93.3	192	135.8	135.8	252	178.2	178.2
13	09.2	09.2	73	51.6	51.6	133	94.0	94.0	193	136.5	136.5	253	178.9	178.9
14	09.9	09.9	74	52.3	52.3	134	94.8	94.8	194	137.2	137.2	254	179.6	179.6
15	10.6	10.6	75	53.0	53.0	135	95.5	95.5	195	137.9	137.9	255	180.3	180.3
16	11.3	11.3	76	53.7	53.7	136	96.2	96.2	196	138.6	138.6	256	181.0	181.0
17	12.0	12.0	77	54.4	54.4	137	96.9	96.9	197	139.3	139.3	257	181.7	181.7
18	12.7	12.7	78	55.2	55.2	138	97.6	97.6	198	140.0	140.0	258	182.4	182.4
19	13.4	13.4	79	55.9	55.9	139	98.3	98.3	199	140.7	140.7	259	183.1	183.1
20	14.1	14.1	80	56.6	56.6	140	99.0	99.0	200	141.4	141.4	260	183.8	183.8
21	14.8	14.8	81	57.3	57.3	141	99.7	99.7	201	142.1	142.1	261	184.6	184.6
22	15.6	15.6	82	58.0	58.0	142	100.4	100.4	202	142.8	142.8	262	185.3	185.3
23	16.3	16.3	83	58.7	58.7	143	101.1	101.1	203	143.5	143.5	263	186.0	186.0
24	17.0	17.0	84	59.4	59.4	144	101.8	101.8	204	144.2	144.2	264	186.7	186.7
25	17.7	17.7	85	60.1	60.1	145	102.5	102.5	205	145.0	145.0	265	187.4	187.4
26	18.4	18.4	86	60.8	60.8	146	103.2	103.2	206	145.7	145.7	266	188.1	188.1
27	19.1	19.1	87	61.5	61.5	147	103.9	103.9	207	146.4	146.4	267	188.8	188.8
28	19.8	19.8	88	62.2	62.2	148	104.7	104.7	208	147.1	147.1	268	189.5	189.5
29	20.5	20.5	89	62.9	62.9	149	105.4	105.4	209	147.8	147.8	269	190.2	190.2
30	21.2	21.2	90	63.6	63.6	150	106.1	106.1	210	148.5	148.5	270	190.9	190.9
31	21.9	21.9	91	64.3	64.3	151	106.8	106.8	211	149.2	149.2	271	191.6	191.6
32	22.6	22.6	92	65.1	65.1	152	107.5	107.5	212	149.9	149.9	272	192.3	192.3
33	23.3	23.3	93	65.8	65.8	153	108.2	108.2	213	150.6	150.6	273	193.0	193.0
34	24.0	24.0	94	66.5	66.5	154	108.9	108.9	214	151.3	151.3	274	193.7	193.7
35	24.7	24.7	95	67.2	67.2	155	109.6	109.6	215	152.0	152.0	275	194.5	194.5
36	25.5	25.5	96	67.9	67.9	156	110.3	110.3	216	152.7	152.7	276	195.2	195.2
37	26.2	26.2	97	68.6	68.6	157	111.0	111.0	217	153.4	153.4	277	195.9	195.9
38	26.9	26.9	98	99.3	69.3	158	111.7	111.7	218	154.1	154.1	278	196.6	196.6
39	27.6	27.6	99	70.0	70.0	159	112.4	112.4	219	154.9	154.9	279	197.3	197.3
40	28.3	28.3	100	70.7	70.7	160	113.1	113.1	220	155.6	155.6	280	198.0	198.0
41	29.0	29.0	101	71.4	71.4	161	113.8	113.8	221	156.3	156.3	281	198.7	198.7
42	29.7	29.7	102	72.1	72.1	162	114.5	114.5	222	157.0	157.0	282	199.4	199.4
43	30.4	30.4	103	72.8	72.8	163	115.3	115.3	223	157.7	157.7	283	200.1	200.1
44	31.1	31.1	104	73.5	73.5	164	116.0	116.0	224	158.4	158.4	284	200.8	200.8
45	31.8	31.8	105	74.2	74.2	165	116.7	116.7	225	159.1	159.1	285	201.5	201.5
46	32.5	32.5	106	75.0	75.0	166	117.4	117.4	226	159.8	159.8	286	202.2	202.2
47	33.2	33.2	107	75.7	75.7	167	118.1	118.1	227	160.5	160.5	287	202.9	202.9
48	33.9	33.9	108	76.4	76.4	168	118.8	118.8	228	161.2	161.2	288	203.6	203.6
49	34.6	34.6	109	77.1	77.1	169	119.5	119.5	229	161.9	161.9	289	204.3	204.3
50	35.4	35.4	110	77.8	77.8	170	120.2	120.2	230	162.6	162.6	290	205.1	205.1
51	36.1	36.1	111	78.5	78.5	171	120.9	120.9	231	163.3	163.3	291	205.8	205.8
52	36.8	36.8	112	79.2	79.2	172	121.6	121.6	232	164.0	164.0	292	206·5	206.5
53	37.5	37.5	113	79.9	79.9	173	122.3	122.3	233	164.8	164.8	293	207.2	207.2
54	38.2	38.2	114	80.6	80.6	174	123.0	123.0	234	165.5	165.5	294	207·9	207.9
55	38.9	38.9	115	81.3	81.3	175	123.7	123.7	235	166.2	166.2	295	208.6	208.6
56	39.6	39.6	116	82.0	82.0	176	124.4	124.4	236	166.9	166.9	296	209.3	209.3
57	40.3	40.3	117	82.7	82.7	177	125.2	125.2	237	167.6	167.6	297	210.0	210.0
58	41.0	41.0	118	83.4	83.4	178	125.9	125.9	238	168.3	168.3	298	210.7	210.7
59	41.7	41.7	119	84.1	84.1	179	126.6	126.6	239	169.0	169.0	299	211.4	211.4
60	42.4	42.4	120	84.9	84.9	180	127.3	127.3	240	169.7	169.7	300	212.1	212.1
Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.	Dist	Dep.	Lat.

For 45 Degrees.

TABLE III.

MEAN REFRACTION.

App. Alt.	Refr.	App. Alt.	Refr.	App. Alt.	Refr.	App. Alt.	Refr.	App. Alt.	Refr.
° ′	′ ″	° ′	′ ″	° ′	′ ″	° ′	′ ″	° ′	′ ″
0 0	33 0	5 0	9 54	10 0	5 15	20 0	2 35	34 0	1 24
0 5	32 10	5 5	9 46	10 10	5 10	20 10	2 34	34 30	1 23
0 10	31 22	5 10	9 38	10 20	5 5	20 20	2 32	35 0	1 21
0 15	30 35	5 15	9 30	10 30	5 0	20 30	2 31	35 30	1 20
0 20	29 50	5 20	9 23	10 40	4 56	20 40	2 29	36 0	1 18
0 25	29 6	5 25	9 15	10 50	4 51	20 50	2 28	36 30	1 17
0 30	28 23	5 30	9 8	11 0	4 47	21 0	2 27	37 0	1 16
0 35	27 41	5 35	9 1	11 10	4 43	21 10	2 26	37 30	1 14
0 40	27 0	5 40	8 54	11 20	4 39	21 20	2 25	38 0	1 13
0 45	26 20	5 45	8 47	11 30	4 34	21 30	2 24	38 30	1 11
0 50	25 42	5 50	8 41	11 40	4 31	21 40	2 23	39 0	1 10
0 55	25 5	5 55	8 34	11 50	4 27	21 50	2 21	39 30	1 9
1 0	24 29	6 0	8 28	12 0	4 23	22 0	2 20	40 0	1 8
1 5	23 54	6 5	8 21	12 10	4 20	22 10	2 19	41 0	1 5
1 10	23 20	6 10	8 15	12 20	4 16	22 20	2 18	42 0	1 3
1 15	22 47	6 15	8 9	12 30	4 13	22 30	2 17	43 0	1 1
1 20	22 15	6 20	8 3	12 40	4 9	22 40	2 16	44 0	0 59
1 25	21 44	6 25	7 57	12 50	4 6	22 50	2 15	45 0	0 57
1 30	21 15	6 30	7 51	13 0	4 3	23 0	2 14	46 0	0 55
1 35	20 46	6 35	7 45	13 10	4 0	23 10	2 13	47 0	0 53
1 40	20 18	6 40	7 40	13 20	3 57	23 20	2 12	48 0	0 51
1 45	19 51	6 45	7 35	13 30	3 54	23 30	2 11	49 0	0 49
1 50	19 25	6 50	7 30	13 40	3 51	23 40	2 10	50 0	0 48
1 55	19 0	6 55	7 25	13 50	3 48	23 50	2 9	51 0	0 46
2 0	18 35	7 0	7 20	14 0	3 45	24 0	2 8	52 0	0 44
2 5	18 11	7 5	7 15	14 10	3 43	24 10	2 7	53 0	0 43
2 10	17 48	7 10	7 11	14 20	3 40	24 20	2 6	54 0	0 41
2 15	17 26	7 15	7 6	14 30	3 38	24 30	2 5	55 0	0 40
2 20	17 4	7 20	7 2	14 40	3 35	24 40	2 4	56 0	0 38
2 25	16 44	7 25	6 57	14 50	3 33	24 50	2 3	57 0	0 37
2 30	16 24	7 30	6 53	15 0	3 30	25 0	2 2	58 0	0 35
2 35	16 4	7 35	6 49	15 10	3 28	25 10	2 1	59 0	0 34
2 40	15 45	7 40	6 45	15 20	3 26	25 20	2 0	60 0	0 33
2 45	15 27	7 45	6 41	15 30	3 24	25 30	1 59	61 0	0 32
2 50	15 9	7 50	6 37	15 40	3 21	25 40	1 58	62 0	0 30
2 55	14 52	7 55	6 33	15 50	3 19	25 50	1 57	63 0	0 29
3 0	14 36	8 0	6 29	16 0	3 17	26 0	1 56	64 0	0 28
3 5	14 20	8 5	6 25	16 10	3 15	26 10	1 55	65 0	0 26
3 10	14 4	8 10	6 22	16 20	3 12	26 20	1 55	66 0	0 25
3 15	13 49	8 15	6 18	16 30	3 10	26 30	1 54	67 0	0 24
3 20	13 34	8 20	6 15	16 40	3 8	26 40	1 53	68 0	0 23
3 25	13 20	8 25	6 11	16 50	3 6	26 50	1 52	69 0	0 22
3 30	13 6	8 30	6 8	17 0	3 4	27 0	1 51	70 0	0 21
3 35	12 53	8 35	6 5	17 10	3 3	27 15	1 50	71 0	0 19
3 40	12 40	8 40	6 1	17 20	3 1	27 30	1 49	72 0	0 18
3 45	12 27	8 45	5 58	17 30	2 59	27 45	1 48	73 0	0 17
3 50	12 15	8 50	5 55	17 40	2 57	28 0	1 47	74 0	0 16
3 55	12 3	8 55	5 52	17 50	2 55	28 15	1 46	75 0	0 15
4 0	11 51	9 0	5 48	18 0	2 54	28 30	1 45	76 0	0 14
4 5	11 40	9 5	5 45	18 10	2 52	28 45	1 44	77 0	0 13
4 10	11 29	9 10	5 42	18 20	2 51	29 0	1 42	78 0	0 12
4 15	11 18	9 15	5 39	18 30	2 49	29 30	1 40	79 0	0 11
4 20	11 8	9 20	5 36	18 40	2 47	30 0	1 38	80 0	0 10
4 25	10 58	9 25	5 34	18 50	2 46	30 30	1 37	81 0	0 9
4 30	10 48	9 30	5 31	19 0	2 44	31 0	1 35	82 0	0 8
4 35	10 39	9 35	5 28	19 10	2 43	31 30	1 33	83 0	0 7
4 40	10 29	9 40	5 25	19 20	2 41	32 0	1 31	84 0	0 6
4 45	10 20	9 45	5 23	19 30	2 40	32 30	1 30	86 0	0 4
4 50	10 11	9 50	5 20	19 40	2 38	33 0	1 28	88 0	0 2
4 55	10 2	9 55	5 18	19 50	2 37	33 30	1 26	90 0	0 0

TAB. IV.

Dip of the Horizon.

Height.	Dip.
Feet	′ ″
1	0 58
2	1 21
3	1 40
4	1 56
5	2 9
6	2 21
7	2 33
8	2 44
9	2 53
10	3 2
11	3 10
12	3 19
13	3 27
14	3 36
15	3 42
16	3 50
17	3 57
18	4 4
19	4 11
20	4 17
21	4 23
22	4 30
23	4 36
24	4 42
26	4 52
28	5 5
30	5 15
35	5 39
40	6 4
45	6 27
50	6 46
60	7 25
70	8 1
80	8 34
90	9 6
100	9 35

TABLE V.

Sun's Parallax in Alt.

Altit.	Parall.
°	″
0	9
10	9
20	8
30	8
40	7
50	6
55	5
60	4
65	4
70	3
75	2
80	2
85	1
90	0

TAB. VI.

Moon's Augmentat.

Alt.	Augm
°	″
0	0
5	1
10	3
15	4
20	6
25	7
30	8
35	9
40	10
45	11
50	12
55	13
60	14
70	15
80	15
90	16

TABLE VII.

Dip at diff. Distances from the Observer.

Miles.	Height of the Eye in Feet.					
	5	10	15	20	25	30
	′	′	′	′	′	′
¼	11	23	34	45	57	68
½	6	12	17	23	28	34
¾	4	8	12	15	19	23
1	3	6	9	12	15	17
1¼	3	5	7	10	12	14
1½	3	4	6	8	10	12
2	2	4	5	7	8	9
2½	2	3	4	6	7	8
3	2	3	4	5	6	7
3½	2	3	4	5	6	6
4	2	3	4	5	5	6
5	2	3	4	4	5	6
6	2	3	4	4	5	5

TABLE VIII.

AMPLITUDES.

DECLINATION.

Lat.	1°		2°		3°		4°		5°		6°		7°		8°		9°		10°		11°		12°		13°		14°	
°	°	'	°	'	°	'	°	'	°	'	°	'	°	'	°	'	°	'	°	'	°	'	°	'	°	'	°	'
1	1	0	2	0	3	0	4	0	5	0	6	0	7	0	8	0	9	0	10	0	11	0	12	0	13	0	14	0
3	1	0	2	0	3	0	4	0	5	0	6	0	7	1	8	1	9	1	10	1	11	1	12	1	13	1	14	1
5	1	0	2	0	3	1	4	1	5	1	6	1	7	2	8	2	9	2	10	2	11	3	12	3	13	3	14	3
7	1	0	2	1	3	1	4	2	5	2	6	3	7	3	8	4	9	4	10	5	11	5	12	5	13	6	14	6
9	1	1	2	1	3	2	4	3	5	4	6	5	7	5	8	6	9	7	10	8	11	8	12	9	13	10	14	11
11	1	1	2	2	3	3	4	4	5	6	6	7	7	8	8	9	9	10	10	11	11	13	12	14	13	15	14	16
13	1	2	2	3	3	5	4	6	5	8	6	10	7	11	8	13	9	14	10	16	11	18	12	19	13	21	14	23
14	1	2	2	4	3	6	4	7	5	9	6	11	7	13	8	15	9	17	10	19	11	20	12	22	13	24	14	26
15	1	2	2	4	3	6	4	8	5	11	6	13	7	15	8	17	9	19	10	21	11	24	12	26	13	28	14	30
16	1	2	2	5	3	7	4	10	5	12	6	15	7	17	8	19	9	22	10	24	11	27	12	29	13	32	14	35
17	1	3	2	5	3	8	4	11	5	14	6	17	7	19	8	22	9	25	10	28	11	31	12	33	13	36	14	39
18	1	3	2	6	3	9	4	12	5	15	6	19	7	22	8	25	9	28	10	31	11	34	12	38	13	41	14	44
19	1	3	2	7	3	10	4	14	5	17	6	21	7	24	8	28	9	31	10	35	11	39	12	42	13	46	14	49
20	1	4	2	8	3	12	4	15	5	19	6	23	7	27	8	31	9	35	10	39	11	43	12	47	13	51	14	55
21	1	4	2	9	3	13	4	17	5	21	6	26	7	30	8	34	9	39	10	43	11	48	12	52	13	57	15	1
22	1	5	2	9	3	14	4	19	5	24	6	28	7	33	8	38	9	43	10	48	11	53	12	57	14	2	15	7
23	1	5	2	10	3	16	4	21	5	26	6	31	7	36	8	42	9	47	10	52	11	58	13	3	14	9	15	14
24	1	6	2	11	3	17	4	23	5	28	6	34	7	40	8	46	9	52	10	57	12	3	13	9	14	15	15	21
25	1	6	2	12	3	19	4	25	5	31	6	37	7	44	8	50	9	56	11	3	12	9	13	16	14	22	15	29
26	1	7	2	14	3	20	4	27	5	34	6	41	7	48	8	54	10	1	11	8	12	15	13	22	14	30	15	37
27	1	7	2	15	3	22	4	29	5	37	6	44	7	52	8	59	10	7	11	14	12	22	13	30	14	37	15	45
28	1	8	2	16	3	24	4	32	5	40	6	48	7	56	9	4	10	12	11	21	12	29	13	37	14	46	15	54
29	1	9	2	17	3	26	4	34	5	43	6	52	8	1	9	9	10	18	11	27	12	36	13	45	14	54	16	3
30	1	9	2	19	3	28	4	37	5	47	6	56	8	5	9	15	10	24	11	34	12	44	13	53	15	3	16	13
31	1	10	2	20	3	30	4	40	5	50	7	0	8	10	9	21	10	31	11	41	12	52	14	2	15	13	16	24
32	1	11	2	22	3	32	4	43	5	54	7	5	8	16	9	27	10	38	11	49	13	0	14	11	15	23	16	34
33	1	12	2	23	3	35	4	46	5	58	7	10	8	21	9	33	10	45	11	57	13	9	14	21	15	34	16	46
34	1	12	2	25	3	37	4	50	6	2	7	15	8	27	9	40	10	53	12	5	13	18	14	31	15	45	16	58
35	1	13	2	27	3	40	4	53	6	6	7	20	8	33	9	47	11	1	12	14	13	28	14	42	15	56	17	11
36	1	14	2	28	3	43	4	57	6	11	7	25	8	40	9	54	11	9	12	24	13	39	14	54	16	9	17	24
37	1	15	2	30	3	45	5	1	6	16	7	31	8	47	10	2	11	18	12	33	13	49	15	5	16	22	17	38
38	1	16	2	32	3	48	5	5	6	21	7	37	8	54	10	10	11	27	12	44	14	1	15	18	16	35	17	53
39	1	17	2	34	3	52	5	9	6	26	7	44	9	1	10	19	11	37	12	55	14	13	15	31	16	50	18	8
40	1	18	2	37	3	55	5	13	6	32	7	51	9	9	10	28	11	47	13	6	14	25	15	45	17	5	18	25
41	1	20	2	39	3	59	5	18	6	38	7	58	9	18	10	38	11	58	13	18	14	39	15	59	17	20	18	42
42	1	21	2	42	4	2	5	23	6	44	8	5	9	26	10	48	12	9	13	31	14	53	16	15	17	37	19	0
43	1	22	2	44	4	6	5	28	6	51	8	13	9	36	10	58	12	21	13	44	15	7	16	31	17	55	19	19
44	1	23	2	47	4	10	5	34	6	58	8	21	9	45	11	9	12	34	13	58	15	23	16	48	18	13	19	39
45	1	25	2	50	4	15	5	40	7	5	8	30	9	55	11	21	12	47	14	13	15	39	17	6	18	33	20	0
46	1	26	2	53	4	19	5	46	7	12	8	39	10	6	11	33	13	1	14	29	15	57	17	25	18	54	20	23
47	1	28	2	56	4	24	5	52	7	21	8	49	10	18	11	46	13	16	14	45	16	15	17	45	19	16	20	47
48	1	30	2	59	4	29	5	59	7	29	8	59	10	30	12	0	13	31	15	2	16	34	18	6	19	39	21	12
49	1	31	3	3	4	35	6	6	7	38	9	10	10	42	12	15	13	48	15	21	16	54	18	29	20	3	21	38
50	1	33	3	7	4	40	6	14	7	48	9	22	10	56	12	30	14	5	15	40	17	16	18	52	20	29	22	7
51	1	35	3	11	4	46	6	22	7	58	9	34	11	10	12	47	14	24	16	1	17	39	19	17	20	57	22	36
52	1	37	3	15	4	53	6	30	8	8	9	47	11	25	13	4	14	43	16	23	18	3	19	44	21	26	23	8
53	1	40	3	19	4	59	6	39	8	20	10	0	11	41	13	22	15	4	16	46	18	29	20	13	21	57	23	42
54	1	42	3	24	5	7	6	49	8	32	10	15	11	58	13	42	15	26	17	11	18	57	20	43	22	30	24	18
55	1	45	3	29	5	14	6	59	8	44	10	30	12	16	14	3	15	50	17	37	19	26	21	15	23	5	24	57
56	1	47	3	35	5	22	7	10	8	58	10	46	12	35	14	25	16	15	18	5	19	57	21	50	23	43	25	38
57	1	50	3	40	5	31	7	22	9	13	11	4	12	56	14	48	16	42	18	36	20	30	22	26	24	24	26	22
58	1	53	3	47	5	40	7	34	9	28	11	23	13	18	15	14	17	10	19	8	21	6	23	6	25	7	27	10
59	1	57	3	53	5	50	7	47	9	45	11	43	13	41	15	41	17	41	19	42	21	45	23	49	25	54	28	1
60	2	0	4	0	6	0	8	1	10	2	12	4	14	6	16	10	18	14	20	19	22	26	24	34	26	44	28	56
61	2	4	4	8	6	12	8	16	10	21	12	27	14	34	16	41	18	49	20	59	23	11	25	24	27	39	29	56
62	2	8	4	16	6	24	8	33	10	42	12	52	15	3	17	15	19	28	21	42	23	59	26	17	28	38	31	1
63	2	12	4	25	6	37	8	50	11	4	13	19	15	34	17	51	20	9	22	29	24	51	27	15	29	42	32	12
64	2	17	4	34	6	51	9	9	11	28	13	48	16	8	18	31	20	54	23	20	25	48	28	19	30	52	33	30
65	2	22	4	44	7	7	9	30	11	54	14	19	16	46	19	14	21	44	24	16	26	50	29	28	32	10	34	55
66	2	28	4	55	7	24	9	53	12	22	14	54	17	26	20	1	22	37	25	16	27	59	30	45	33	35	36	30

TABLE VIII.

AMPLITUDES.

DECLINATION.

Lat	15°	16°	17°	18°	19°	20°	21°	21½°	22°	22½°	23°	23½°
°	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
1	15 0	16 0	17 0	18 0	19 0	20 0	21 0	21 30	22 0	22 30	23 0	23 3
3	15 1	16 1	17 1	18 2	19 2	20 2	21 2	21 32	22 2	22 32	23 2	23 3
5	15 4	16 4	17 4	18 4	19 5	20 5	21 5	21 35	22 5	22 35	23 6	23 3
7	15 7	16 7	17 8	18 8	19 9	20 9	21 10	21 40	22 10	22 41	23 11	23 41
9	15 11	16 12	17 13	18 14	19 15	20 16	21 16	21 47	22 17	22 48	23 18	23 4
11	15 17	16 18	17 20	18 21	19 22	20 23	21 25	21 55	22 26	22 57	23 27	23 5
13	15 24	16 26	17 28	18 29	19 31	20 33	21 35	22 6	22 37	23 8	23 38	24
14	15 28	16 30	17 32	18 34	19 36	20 38	21 40	22 11	22 43	23 14	23 45	24 1
15	15 33	16 35	17 37	18 39	19 42	20 44	21 47	22 18	22 49	23 20	23 52	24 2
16	15 37	16 40	17 42	18 45	19 48	20 51	21 53	22 25	22 56	23 28	23 59	24 3
17	15 42	16 45	17 48	18 51	19 54	20 57	22 1	22 32	23 4	23 35	24 7	24 3
18	15 47	16 51	17 54	18 58	20 1	21 5	22 8	22 40	23 12	23 44	24 15	24 47
19	15 53	16 57	18 1	19 5	20 8	21 12	22 16	22 49	23 20	23 52	24 25	24 57
20	15 59	17 3	18 8	19 12	20 16	21 21	22 25	22 57	23 30	24 2	24 34	25 7
21	16 6	17 10	18 15	19 20	20 25	21 29	22 34	23 7	23 39	24 12	24 45	25 17
22	16 13	17 18	18 23	19 28	20 33	21 39	22 44	23 17	23 50	24 23	24 55	25 2
23	16 20	17 25	18 31	19 37	20 43	21 49	22 55	23 28	24 1	24 34	25 7	25 4
24	16 27	17 34	18 40	19 46	20 53	21 59	23 6	23 39	24 13	24 46	25 19	25 5
25	16 36	17 42	18 49	19 56	21 3	22 10	23 18	23 51	24 25	24 59	25 32	26
26	16 44	17 52	18 59	20 7	21 14	22 22	23 30	24 4	24 38	25 12	25 46	26 2
27	16 53	18 1	19 9	20 18	21 26	22 34	23 43	24 17	24 52	25 26	26 1	26 35
28	17 3	18 11	19 20	20 29	21 38	22 47	23 57	24 31	25 6	25 41	26 16	26 51
29	17 13	18 22	19 32	20 41	21 51	23 1	24 11	24 46	25 22	25 57	26 32	27 7
30	17 23	18 34	19 44	20 54	22 5	23 16	24 27	25 2	25 38	26 13	26 49	27 2
31	17 34	18 45	19 57	21 8	22 19	23 31	24 43	25 19	25 55	26 31	27 7	27 4
32	17 46	18 58	20 10	21 22	22 35	23 47	25 0	25 36	26 13	26 49	27 26	28
33	17 59	19 11	20 24	21 37	22 51	24 4	25 18	25 55	26 32	27 9	27 46	28 2
34	18 11	19 25	20 39	21 53	23 7	24 22	25 37	26 14	26 52	27 29	28 7	28 4
35	18 25	19 40	20 55	22 10	23 25	24 41	25 57	26 35	27 13	27 51	28 29	29
36	18 39	19 55	21 11	22 27	23 44	25 1	26 18	26 56	27 35	28 14	28 53	29 3
37	18 55	20 11	21 28	22 46	24 3	25 21	26 40	27 19	27 58	28 38	29 17	29 57
38	19 10	20 28	21 47	23 5	24 24	25 43	27 3	27 43	28 28	29 3	29 44	30 2
39	19 27	20 46	22 6	23 26	24 46	26 7	27 28	28 8	28 49	29 30	30 11	30 5
40	19 45	21 5	22 26	23 47	25 9	26 31	27 54	28 35	29 17	29 58	30 40	31 2
41	20 3	21 25	22 48	24 10	25 33	26 57	28 21	29 3	29 46	30 28	31 11	31 54
42	20 23	21 46	23 10	24 34	25 59	27 24	28 50	29 33	30 16	31 0	31 43	32 27
43	20 44	22 8	23 34	25 00	26 26	27 53	29 20	30 5	30 49	31 33	32 18	33
44	21 5	22 32	23 59	25 26	26 55	28 23	29 53	30 38	31 23	32 8	32 54	33 3
45	21 28	22 57	24 25	25 55	27 25	28 56	30 27	31 13	31 59	32 46	33 33	34 2
46	21 53	23 23	24 53	26 25	27 57	29 30	31 3	31 51	32 38	33 26	34 14	35
47	22 18	23 50	25 23	26 57	28 31	30 6	31 42	32 30	33 19	34 8	34 57	35 47
48	22 45	24 20	25 55	27 30	29 7	30 44	32 23	33 13	34 3	34 53	35 41	36 3
49	23 14	24 51	26 28	28 6	29 45	31 25	33 7	33 58	34 49	35 41	36 33	37 2
50	23 45	25 24	27 3	28 44	30 26	32 9	33 58	34 46	35 39	36 32	37 26	38 2
51	24 17	25 59	27 41	29 25	31 9	32 55	34 43	35 37	36 32	37 27	38 23	39 1
52	24 52	26 36	28 21	30 8	31 56	33 45	35 36	36 32	37 29	38 26	39 24	40 2
53	25 28	27 16	29 4	30 54	32 45	34 38	36 33	37 31	38 30	39 29	40 29	41 3
54	26 7	27 58	29 50	31 43	33 38	35 35	37 34	38 34	39 36	40 37	41 40	42 4
55	26 49	28 43	30 39	32 36	34 35	36 36	38 40	39 43	40 47	41 51	42 56	44
56	27 34	29 32	31 31	33 33	35 36	37 42	39 51	40 57	42 4	43 11	44 20	45 2
57	28 22	30 24	32 28	34 34	36 43	38 54	41 9	42 18	43 27	44 38	45 50	47
58	29 14	31 21	33 29	35 40	37 54	40 12	42 33	43 45	44 59	46 14	47 30	48 4
59	30 10	32 21	34 35	36 52	39 12	41 37	44 6	45 22	46 40	47 59	49 21	50 4
60	31 10	33 27	35 47	38 10	40 38	43 10	45 47	47 8	48 31	49 56	51 24	52 5
61	32 16	34 39	37 5	39 36	42 11	44 52	47 40	49 7	50 36	52 7	53 42	55 2
62	33 27	35 57	38 31	41 10	43 54	46 46	49 46	51 19	52 56	54 36	56 20	58
63	34 45	37 23	40 5	42 54	45 49	48 53	52 8	53 50	55 36	57 27	59 23	61 2
64	36 11	38 58	41 50	44 49	47 58	51 17	54 50	56 44	58 43	60 48	63 2	65 27
65	37 46	40 43	43 46	46 59	50 23	54 2	57 59	60 8	62 25	64 53	67 36	70 59
66	39 31	42 40	45 57	49 27	53 10	57 14	61 46	64 18	67 4	70 12	73 52	78 38

TABLE IX.

SEMIDIURNAL AND SEMINOCTURNAL ARCHES.

For finding the time of the Rising and Setting of the Sun, Moon, or Stars.

DECLINATION.

Lat.	1°	2°	3°	4°	5°	6°	7°	8°	9°	10°	11°	12°	13°	14°	15°	16°	La
°	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	°
1	6 00	6 00	6 00	6 00	6 00	6 00	6 00	6 01	6 01	6 01	6 01	6 01	6 01	6 01	6 01	6 01	1
3	6 00	6 00	6 01	6 01	6 01	6 01	6 01	6 02	6 02	6 02	6 02	6 03	6 03	6 03	6 03	6 03	3
5	6 00	6 01	6 01	6 01	6 02	6 02	6 02	6 03	6 03	6 04	6 04	6 04	6 05	6 05	6 05	6 06	5
7	6 00	6 01	6 01	6 02	6 02	6 03	6 03	6 04	6 04	6 05	6 05	6 06	6 06	6 07	6 08	6 08	7
9	6 01	6 01	6 02	6 03	6 03	6 04	6 04	6 05	6 06	6 06	6 07	6 08	6 08	6 09	6 10	6 10	9
11	6 01	6 02	6 02	6 03	6 04	6 05	6 05	6 06	6 07	6 08	6 09	6 09	6 10	6 11	6 12	6 13	11
13	6 01	6 02	6 03	6 04	6 05	6 06	6 06	6 07	6 08	6 09	6 10	6 11	6 12	6 13	6 14	6 15	13
14	6 01	6 02	6 03	6 04	6 05	6 06	6 07	6 08	6 09	6 10	6 11	6 12	6 13	6 14	6 15	6 16	14
15	6 01	6 02	6 03	6 04	6 05	6 06	6 08	6 09	6 10	6 11	6 12	6 13	6 14	6 15	6 16	6 18	15
16	6 01	6 02	6 03	6 05	6 06	6 07	6 08	6 09	6 10	6 12	6 13	6 14	6 15	6 16	6 18	6 19	16
17	6 01	6 02	6 04	6 05	6 06	6 07	6 09	6 10	6 11	6 12	6 14	6 15	6 16	6 17	6 19	6 20	17
18	6 01	6 03	6 04	6 05	6 07	6 08	6 09	6 10	6 12	6 13	6 14	6 16	6 17	6 19	6 20	6 21	18
19	6 01	6 03	6 04	6 06	6 07	6 08	6 10	6 11	6 13	6 14	6 15	6 17	6 18	6 20	6 21	6 23	19
20	6 01	6 03	6 04	6 06	6 07	6 09	6 10	6 12	6 13	6 15	6 16	6 18	6 19	6 21	6 22	6 24	20
21	6 02	6 03	6 05	6 06	6 08	6 09	6 11	6 12	6 14	6 16	6 17	6 19	6 20	6 22	6 24	6 25	21
22	6 02	6 03	6 05	6 06	6 08	6 10	6 11	6 13	6 15	6 16	6 18	6 20	6 21	6 23	6 25	6 27	22
23	6 02	6 03	6 05	6 07	6 09	6 10	6 12	6 14	6 15	6 17	6 19	6 21	6 22	6 24	6 26	6 28	23
24	6 02	6 04	6 05	6 07	6 09	6 11	6 13	6 14	6 16	6 18	6 20	6 22	6 24	6 26	6 27	6 29	24
25	6 02	6 04	6 06	6 07	6 09	6 11	6 13	6 15	6 17	6 19	6 21	6 23	6 25	6 27	6 29	6 31	25
26	6 02	6 04	6 06	6 08	6 10	6 12	6 14	6 16	6 18	6 20	6 22	6 24	6 26	6 28	6 30	6 32	26
27	6 02	6 04	6 06	6 08	6 10	6 12	6 14	6 16	6 19	6 21	6 23	6 25	6 27	6 29	6 31	6 34	27
28	6 02	6 04	6 06	6 09	6 11	6 13	6 15	6 17	6 19	6 22	6 24	6 26	6 28	6 30	6 33	6 35	28
29	6 02	6 04	6 07	6 09	6 11	6 13	6 16	6 18	6 20	6 22	6 25	6 27	6 29	6 32	6 34	6 37	29
30	6 02	6 05	6 07	6 09	6 12	6 14	6 16	6 19	6 21	6 23	6 26	6 28	6 31	6 33	6 36	6 38	30
31	6 02	6 05	6 07	6 10	6 12	6 14	6 17	6 19	6 22	6 24	6 27	6 29	6 32	6 34	6 37	6 40	31
32	6 02	6 05	6 08	6 10	6 13	6 15	6 18	6 20	6 23	6 25	6 28	6 31	6 33	6 36	6 39	6 41	32
33	6 03	6 05	6 08	6 10	6 13	6 16	6 18	6 21	6 24	6 26	6 29	6 32	6 34	6 37	6 40	6 43	33
34	6 03	6 05	6 08	6 11	6 14	6 16	6 19	6 22	6 25	6 27	6 30	6 33	6 36	6 39	6 42	6 45	34
35	6 03	6 06	6 08	6 11	6 14	6 17	6 20	6 23	6 25	6 28	6 31	6 34	6 37	6 40	6 43	6 46	35
36	6 03	6 06	6 09	6 12	6 15	6 18	6 20	6 23	6 26	6 29	6 32	6 36	6 39	6 42	6 45	6 48	36
37	6 03	6 06	6 09	6 12	6 15	6 18	6 21	6 24	6 27	6 31	6 34	6 37	6 40	6 43	6 47	6 50	37
38	6 03	6 06	6 09	6 13	6 16	6 19	6 22	6 25	6 28	6 32	6 35	6 38	6 42	6 45	6 48	6 52	38
39	6 03	6 06	6 10	6 13	6 16	6 20	6 23	6 26	6 29	6 33	6 36	6 40	6 43	6 47	6 50	6 54	39
40	6 03	6 07	6 10	6 13	6 17	6 20	6 24	6 27	6 31	6 34	6 38	6 41	6 45	6 48	6 52	6 56	40
41	6 03	6 07	6 10	6 14	6 17	6 21	6 25	6 28	6 32	6 35	6 39	6 43	6 46	6 50	6 54	6 58	41
42	6 04	6 07	6 11	6 14	6 18	6 22	6 25	6 29	6 33	6 37	6 40	6 44	6 48	6 52	6 56	7 00	42
43	6 04	6 07	6 11	6 15	6 19	6 22	6 26	6 30	6 34	6 38	6 42	6 46	6 50	6 54	6 58	7 02	43
44	6 04	6 08	6 12	6 15	6 19	6 23	6 27	6 31	6 35	6 39	6 43	6 47	6 52	6 56	7 00	7 04	44
45	6 04	6 08	6 12	6 16	6 20	6 24	6 28	6 32	6 36	6 41	6 45	6 49	6 53	6 58	7 02	7 07	45
46	6 04	6 08	6 12	6 17	6 21	6 25	6 29	6 33	6 38	6 42	6 46	6 51	6 55	7 00	7 04	7 09	46
47	6 04	6 09	6 13	6 17	6 22	6 26	6 30	6 35	6 39	6 44	6 48	6 53	6 57	7 02	7 07	7 12	47
48	6 04	6 09	6 13	6 18	6 22	6 27	6 31	6 36	6 41	6 45	6 50	6 55	6 59	7 04	7 09	7 14	48
49	6 05	6 09	6 14	6 18	6 23	6 28	6 32	6 37	6 42	6 47	6 52	6 57	7 02	7 07	7 12	7 17	49
50	6 05	6 10	6 14	6 19	6 24	6 29	6 34	6 39	6 44	6 49	6 54	6 59	7 04	7 09	7 14	7 20	50
51	6 05	6 10	6 15	6 20	6 25	6 30	6 35	6 40	6 45	6 50	6 56	7 01	7 06	7 12	7 17	7 23	51
52	6 05	6 10	6 15	6 21	6 26	6 31	6 36	6 41	6 47	6 52	6 58	7 03	7 09	7 14	7 20	7 26	52
53	6 05	6 11	6 16	6 21	6 27	6 32	6 38	6 43	6 49	6 54	7 09	7 06	7 11	7 17	7 23	7 29	53
54	6 06	6 11	6 17	6 22	6 28	6 33	6 39	6 45	6 50	6 56	7 02	7 08	7 14	7 20	7 27	7 33	54
55	6 06	6 11	6 17	6 23	6 29	6 35	6 40	6 46	6 52	6 58	7 04	7 11	7 17	7 23	7 30	7 37	55
56	6 06	6 12	6 18	6 24	6 30	6 36	6 42	6 48	6 54	7 01	7 07	7 13	7 20	7 27	7 34	7 41	56
57	6 06	6 12	6 19	6 25	6 31	6 37	6 44	6 50	6 56	7 03	7 10	7 16	7 23	7 30	7 37	7 45	57
58	6 06	6 13	6 19	6 26	6 32	6 39	6 45	6 52	6 59	7 06	7 12	7 20	7 27	7 34	7 42	7 49	58
59	6 07	6 13	6 20	6 27	6 33	6 40	6 47	6 54	7 01	7 08	7 16	7 23	7 30	7 38	7 46	7 54	59
60	6 07	6 14	6 21	6 28	6 35	6 42	6 49	6 56	7 04	7 11	7 19	7 26	7 34	7 42	7 51	7 59	60
61	6 07	6 14	6 22	6 29	6 36	6 44	6 51	6 59	7 06	7 14	7 22	7 30	7 38	7 47	7 56	8 05	61
62	6 08	6 15	6 23	6 30	6 38	6 46	6 53	7 01	7 09	7 17	7 26	7 34	7 43	7 52	8 01	8 11	62
63	6 08	6 16	6 24	6 32	6 40	6 48	6 56	7 04	7 12	7 21	7 30	7 39	7 48	7 57	8 07	8 17	63
64	6 08	6 16	6 25	6 33	6 41	6 50	6 58	7 07	7 16	7 25	7 34	7 43	7 53	8 03	8 13	8 24	64
65	6 09	6 17	6 26	6 34	6 43	6 52	7 01	7 10	7 19	7 29	7 39	7 48	7 59	8 09	8 20	8 32	65
66	6 09	6 18	6 27	6 36	6 45	6 55	7 04	7 14	7 23	7 33	7 42	7 54	8 05	8 16	8 28	8 40	66

TABLE IX.

SEMIDIURNAL AND SEMINOCTURNAL ARCHES,

For finding the Time of the Rising and Setting of the Sun, Moon, or Stars.

DECLINATION.

Lat	17°	18°	19°	20°	21°	22°	23°	24°	25°	26°	27°	28°	29°	30°	La
°	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	°
1	6 01	6 01	6 01	6 01	6 02	6 02	6 02	6 02	6 02	6 02	6 02	6 02	6 02	6 02	1
3	6 04	6 04	6 04	6 04	6 05	6 05	6 05	6 05	6 06	6 06	6 06	6 06	6 07	6 07	3
5	6 06	6 07	6 07	6 07	6 08	6 08	6 09	6 09	6 09	6 10	6 10	6 11	6 11	6 12	5
7	6 09	6 09	6 10	6 10	6 11	6 11	6 12	6 13	6 13	6 14	6 14	6 15	6 16	6 16	7
9	6 11	6 12	6 13	6 13	6 14	6 15	6 15	6 16	6 17	6 18	6 19	6 19	6 20	6 21	9
11	6 14	6 14	6 15	6 16	6 17	6 18	6 19	6 20	6 21	6 22	6 23	6 24	6 25	6 26	11
13	6 16	6 17	6 18	6 19	6 20	6 21	6 22	6 24	6 25	6 26	6 27	6 28	6 29	6 31	13
14	6 17	6 19	6 20	6 21	6 22	6 23	6 24	6 25	6 27	6 28	6 29	6 30	6 32	6 33	14
15	6 19	6 20	6 21	6 22	6 24	6 25	6 26	6 27	6 29	6 30	6 31	6 33	6 34	6 36	15
16	6 20	6 21	6 23	6 24	6 25	6 27	6 28	6 29	6 31	6 32	6 34	6 35	6 37	6 38	16
17	6 21	6 23	6 24	6 26	6 27	6 28	6 30	6 31	6 33	6 34	6 36	6 37	6 39	6 41	17
18	6 23	6 24	6 26	6 27	6 29	6 30	6 32	6 33	6 35	6 36	6 38	6 40	6 41	6 43	18
19	6 24	6 26	6 27	6 29	6 30	6 32	6 34	6 35	6 37	6 39	6 40	6 42	6 44	6 46	19
20	6 26	6 27	6 29	6 30	6 32	6 34	6 36	6 37	6 39	6 41	6 43	6 45	6 47	6 49	20
21	6 27	6 29	6 30	6 32	6 34	6 36	6 38	6 39	6 41	6 43	6 45	6 47	6 49	6 51	21
22	6 28	6 30	6 32	6 34	6 36	6 38	6 39	6 41	6 43	6 45	6 48	6 50	6 52	6 54	22
23	6 30	6 32	6 34	6 36	6 38	6 39	6 42	6 44	6 46	6 48	6 50	6 52	6 54	6 57	23
24	6 31	6 33	6 35	6 37	6 39	6 41	6 44	6 46	6 48	6 50	6 52	6 55	6 57	7 00	24
25	6 33	6 35	6 37	6 39	6 41	6 43	6 46	6 48	6 50	6 53	6 55	6 57	7 00	7 02	25
26	6 34	6 36	6 39	6 41	6 43	6 45	6 48	6 50	6 53	6 55	6 58	7 00	7 03	7 05	26
27	6 36	6 38	6 40	6 43	6 45	6 48	6 50	6 52	6 55	6 58	7 00	7 03	7 06	7 08	27
28	6 37	6 40	6 42	6 45	6 47	6 50	6 52	6 55	6 57	7 00	7 03	7 06	7 09	7 11	28
29	6 39	6 42	6 44	6 47	6 49	6 52	6 54	6 57	7 00	7 03	7 06	7 09	7 12	7 15	29
30	6 41	6 43	6 46	6 49	6 51	6 54	6 57	7 00	7 02	7 05	7 08	7 11	7 15	7 18	30
31	6 42	6 45	6 48	6 51	6 53	6 56	6 59	7 02	7 05	7 08	7 11	7 14	7 18	7 21	31
32	6 44	6 47	6 50	6 53	6 56	6 58	7 01	7 05	7 08	7 11	7 14	7 18	7 21	7 25	32
33	6 46	6 49	6 52	6 55	6 58	7 01	7 04	7 07	7 11	7 14	7 17	7 21	7 24	7 28	33
34	6 48	6 51	6 54	6 57	7 00	7 03	7 07	7 10	7 13	7 17	7 20	7 24	7 28	7 32	34
35	6 49	6 53	6 56	6 59	7 02	7 06	7 09	7 13	7 16	7 20	7 24	7 27	7 31	7 35	35
36	6 51	6 55	6 58	7 01	7 05	7 08	7 12	7 16	7 19	7 23	7 27	7 31	7 35	7 39	36
37	6 53	6 57	7 00	7 04	7 07	7 11	7 15	7 18	7 22	7 26	7 30	7 34	7 39	7 43	37
38	6 55	6 59	7 02	7 06	7 10	7 14	7 17	7 21	7 25	7 30	7 34	7 38	7 43	7 47	38
39	6 57	7 01	7 05	7 09	7 12	7 16	7 20	7 25	7 29	7 33	7 37	7 42	7 47	7 51	39
40	6 59	7 03	7 07	7 11	7 15	7 19	7 23	7 28	7 32	7 37	7 41	7 46	7 51	7 56	40
41	7 02	7 06	7 10	7 14	7 18	7 22	7 27	7 31	7 36	7 40	7 45	7 50	7 55	8 00	41
42	7 04	7 08	7 12	7 17	7 21	7 25	7 30	7 35	7 39	7 44	7 49	7 55	8 00	8 05	42
43	7 06	7 11	7 15	7 19	7 24	7 29	7 33	7 38	7 43	7 48	7 53	7 59	8 04	8 10	43
44	7 09	7 13	7 18	7 22	7 27	7 32	7 37	7 42	7 47	7 52	7 58	8 04	8 09	8 16	44
45	7 11	7 16	7 21	7 25	7 30	7 35	7 40	7 46	7 51	7 57	8 03	8 08	8 15	8 21	45
46	7 14	7 19	7 24	7 29	7 34	7 39	7 44	7 50	7 55	8 01	8 07	8 14	8 20	8 27	46
47	7 17	7 22	7 27	7 32	7 37	7 43	7 48	7 54	8 00	8 06	8 12	8 19	8 26	8 33	47
48	7 19	7 25	7 30	7 35	7 41	7 47	7 53	7 59	8 05	8 11	8 18	8 25	8 32	8 40	48
49	7 22	7 28	7 33	7 39	7 45	7 51	7 57	8 03	8 10	8 17	8 24	8 31	8 38	8 46	49
50	7 25	7 31	7 37	7 43	7 49	7 55	8 02	8 08	8 15	8 22	8 30	8 37	8 45	8 54	50
51	7 29	7 35	7 41	7 47	7 53	8 00	8 06	8 13	8 21	8 28	8 36	8 44	8 53	9 02	51
52	7 32	7 38	7 45	7 51	7 58	8 05	8 12	8 19	8 27	8 35	8 43	8 52	9 01	9 11	52
53	7 36	7 42	7 49	7 56	8 02	8 10	8 17	8 25	8 33	8 41	8 50	9 00	9 09	9 20	53
54	7 40	7 46	7 53	8 00	8 08	8 15	8 23	8 31	8 40	8 49	8 58	9 08	9 19	9 30	54
55	7 44	7 51	7 58	8 05	8 13	8 21	8 29	8 38	8 47	8 57	9 07	9 18	9 29	9 42	55
56	7 48	7 55	8 03	8 11	8 19	8 27	8 36	8 45	8 55	9 05	9 16	9 28	9 41	9 55	56
57	7 52	8 00	8 08	8 16	8 25	8 34	8 43	8 53	9 04	9 15	9 27	9 40	9 54	10 11	57
58	7 57	8 05	8 14	8 22	8 32	8 41	8 51	9 02	9 13	9 25	9 38	9 53	10 10	10 30	58
59	8 02	8 11	8 20	8 29	8 39	8 49	9 00	9 11	9 24	9 37	9 52	10 09	10 29	10 56	59
60	8 08	8 17	8 26	8 36	8 47	8 58	9 09	9 22	9 35	9 51	10 08	10 28	10 55	12 00	60
61	8 14	8 24	8 34	8 44	8 55	9 07	9 20	9 34	9 49	10 07	10 27	10 54	12 00		61
62	8 20	8 31	8 42	8 53	9 05	9 18	9 32	9 47	10 05	10 26	10 54	12 00			62
63	8 27	8 38	8 50	9 02	9 16	9 30	9 46	10 04	10 25	10 53	12 00				63
64	8 35	8 47	9 00	9 13	9 28	9 44	10 02	10 24	10 52	12 00					64
65	8 44	8 57	9 10	9 25	9 42	10 00	10 22	10 51	12 00						65
66	8 53	9 07	9 23	9 39	9 58	10 21	10 50	12 00							66

TABLE X.

SUN'S MEAN RIGHT ASCENSION.

Days.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Days.
	h. m.	h. m.	h. m.	h. m.	h. m.	h. m.	h. m.	h. m.	h. m.	h. m.	h. m.	h. m.	
1	18 46	20 58	22 48	0 42	2 33	4 35	6 40	8 45	10 41	12 29	14 25	16 29	1
2	18 50	21 02	22 52	0 45	2 37	4 40	6 44	8 49	10 44	12 32	14 29	16 33	2
3	18 54	21 06	22 56	0 49	2 40	4 44	6 48	8 52	10 48	12 36	14 33	16 37	3
4	18 59	21 10	22 59	0 53	2 44	4 48	6 52	8 56	10 52	12 40	14 37	16 42	4
5	19 03	21 14	23 03	0 56	2 48	4 52	6 56	9 00	10 55	12 43	14 41	16 46	5
6	19 08	21 18	23 07	1 00	2 52	4 56	7 00	9 04	10 59	12 47	14 45	16 51	6
7	19 12	21 22	23 10	1 04	2 56	5 00	7 04	9 08	11 02	12 51	14 49	16 55	7
8	19 16	21 26	23 14	1 07	3 00	5 04	7 09	9 12	11 06	12 54	14 53	16 59	8
9	19 21	21 30	23 18	1 11	3 04	5 08	7 13	9 15	11 10	12 58	14 57	17 04	9
10	19 25	21 34	23 21	1 15	3 08	5 13	7 17	9 19	11 13	13 02	15 01	17 08	10
11	19 29	21 38	23 25	1 18	3 11	5 17	7 21	9 23	11 17	13 05	15 05	17 13	11
12	19 34	21 42	23 29	1 22	3 15	5 21	7 25	9 27	11 20	13 09	15 09	17 17	12
13	19 38	21 46	23 33	1 26	3 19	5 25	7 29	9 31	11 24	13 13	15 13	17 21	13
14	19 42	21 50	23 36	1 29	3 23	5 29	7 33	9 34	11 28	13 16	15 17	17 26	14
15	19 47	21 54	23 40	1 33	3 27	5 33	7 37	9 38	11 31	13 20	15 21	17 30	15
16	19 51	21 58	23 43	1 37	3 31	5 37	7 41	9 42	11 35	13 24	15 25	17 35	16
17	19 55	22 02	23 47	1 40	3 35	5 42	7 45	9 46	11 38	13 28	15 30	17 39	17
18	20 00	22 05	23 51	1 44	3 39	5 46	7 49	9 49	11 42	13 31	15 35	17 43	18
19	20 04	22 09	23 54	1 48	3 43	5 50	7 53	9 53	11 46	13 35	15 38	17 48	19
20	20 08	22 13	23 58	1 51	3 47	5 54	7 57	9 57	11 49	13 39	15 42	17 52	20
21	20 12	22 17	0 02	1 55	3 51	5 58	8 01	10 00	11 53	13 43	15 46	17 57	21
22	20 17	22 21	0 05	1 59	3 55	6 02	8 05	10 04	11 56	13 46	15 50	18 01	22
23	20 21	22 25	0 09	2 03	3 59	6 07	8 09	10 08	12 00	13 50	15 55	18 06	23
24	20 25	22 28	0 13	2 06	4 03	6 11	8 13	10 12	12 04	13 54	15 59	18 10	24
25	20 29	22 32	0 16	2 10	4 07	6 15	8 17	10 15	12 07	13 58	16 03	18 15	25
26	20 33	22 36	0 20	2 14	4 11	6 19	8 21	10 19	12 11	14 02	16 07	18 19	26
27	20 37	22 40	0 23	2 18	4 15	6 23	8 25	10 23	12 14	14 06	16 12	18 23	27
28	20 42	22 43	0 27	2 21	4 19	6 27	8 29	10 26	12 18	14 09	16 16	18 28	28
29	20 46	22 46	0 31	2 25	4 23	6 31	8 33	10 30	12 22	14 13	16 20	18 32	29
30	20 50		0 34	2 29	4 27	6 36	8 37	10 33	12 25	14 17	16 25	18 37	30
31	20 54		0 38		4 31		8 41	10 37		14 21		18 41	31

TABLE XI.—To correct the MEAN REFRACTION.

App. Alt.	Height of the Thermometer.									App. Alt.	Height of the Thermometer.								
	20″	28°	36°	44°	50°	56°	64°	72°	80°		20°	28°	36°	44°	50°	56°	64°	72°	80°
° ′	add	add	add	add	″	sub	sub	sub	sub	°	add	add	add	add	″	sub	sub	sub	sub
3 0	71″	51″	32″	13	0	13″	30″	46	61″	14	18″	13″	8″	4″	0	3″	7″	11″	16″
3 30	64	46	29	12	0	12	27	41	55	16	16	12	7	3	0	3	6	10	14
4 0	58	41	26	11	0	10	24	37	50	18	14	10	6	3	0	2	6	9	12
4 30	53	38	24	10	0	9	22	34	45	20	13	9	6	2	0	2	5	8	11
5 0	48	35	22	9	0	9	20	31	40	22	11	8	5	2	0	2	5	7	10
5 30	45	32	20	9	0	8	19	29	38	24	10	7	5	2	0	2	4	6	9
6 0	41	30	19	8	0	7	17	26	35	26	9	7	4	2	0	2	4	6	8
6 30	38	28	17	7	0	7	15	24	33	28	9	6	4	2	0	1	3	5	7
7 0	36	26	16	7	0	6	14	23	31	30	8	6	4	2	0	1	3	5	7
7 30	34	25	16	7	0	6	14	22	29	35	7	5	3	1	0	1	3	4	6
8 0	32	23	15	6	0	5	13	20	27	40	6	4	3	1	0	1	2	3	5
8 30	30	22	14	6	0	5	12	19	26	50	4	3	2	1	0	1	2	2	3
9 0	28	20	13	5	0	5	11	18	24	60	3	2	1	1	0	0	1	2	2
10 0	26	18	12	5	0	4	10	16	22	70	2	1	1	0	0	0	1	1	1
11 0	23	17	11	5	0	4	9	15	20	80	1	1	0	0	0	0	0	1	1
12 0	21	15	10	4	0	4	9	13	18	90	0	0	0	0	0	0	0	0	0
			30.7	30.1	29.6	29.2	28.6						30.7	30.1	29.6	29.2	28.6		
	Height of the Barometer.										Height of the Barometer.								

TABLE XII.

For reducing the Time of the Moon's Passage over the Meridian of Greenwich to the Time of its Passage over any other Meridian.

Long.	Daily Variation of the Moon's passing the Meridian.														Time from Moon's Southing.
	40 m	42 m	44 m	46 m	48 m	50 m	52 m	54 m	56 m	58 m	60 m	62 m	64 m	66 m	
°	m	m	m	m	m	m	m	m	m	m	m	m	m	m	h. m.
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 0
5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0 20
10	1	1	1	1	1	1	1	1	2	2	2	2	2	2	0 40
15	2	2	2	2	2	2	2	2	2	2	2	3	3	3	1 0
20	2	2	2	3	3	3	3	3	3	3	3	3	4	4	1 20
25	3	3	3	3	3	3	4	4	4	4	4	4	4	5	1 40
30	3	3	4	4	4	4	4	4	5	5	5	5	5	5	2 0
35	4	4	4	4	5	5	5	5	5	6	6	6	6	6	2 20
40	4	5	5	5	5	6	6	6	6	6	7	7	7	7	2 40
45	5	5	5	6	6	6	6	7	7	7	7	8	8	8	3 0
50	6	6	6	6	7	7	7	7	8	8	8	9	9	9	3 20
55	6	6	7	7	7	8	8	8	9	9	9	9	10	10	3 40
60	7	7	7	8	8	8	9	9	9	10	10	10	11	11	4 0
65	7	8	8	8	9	9	9	10	10	10	11	11	12	12	4 20
70	8	8	9	9	9	10	10	10	11	11	12	12	12	13	4 40
75	8	9	9	10	10	10	11	11	12	12	12	13	13	14	5 0
80	9	9	10	10	11	11	12	12	12	13	13	14	14	15	5 20
85	9	10	10	11	11	12	12	13	13	14	14	15	15	16	5 40
90	10	10	11	11	12	12	13	13	14	14	15	15	16	16	6 0
95	11	11	12	12	13	13	14	14	15	15	16	16	17	17	6 20
100	11	12	12	13	13	14	14	15	16	16	17	17	18	18	6 40
105	12	12	13	13	14	14	15	16	16	17	17	18	19	19	7 0
110	12	13	13	14	15	15	16	16	17	18	18	19	20	20	7 20
115	13	13	14	15	15	16	17	17	18	19	19	20	20	21	7 40
120	13	14	15	15	16	17	17	18	19	19	20	21	21	22	8 0
125	14	15	15	16	17	17	18	19	19	20	21	22	22	23	8 20
130	14	15	16	17	17	18	19	19	20	21	22	22	23	24	8 40
135	15	16	16	17	18	19	19	20	21	22	22	23	24	25	9 0
140	16	16	17	18	19	19	20	21	22	23	23	24	25	26	9 20
145	16	17	18	19	19	20	21	22	23	23	24	25	26	27	9 40
150	17	17	18	19	20	21	22	22	23	24	25	26	27	27	10 0
155	17	18	19	20	21	22	22	23	24	25	26	27	28	28	10 20
160	18	19	20	20	21	22	23	24	25	26	27	28	28	29	10 40
165	18	19	20	21	22	23	24	25	26	27	27	28	29	30	11 0
170	19	20	21	22	23	24	25	25	26	27	28	29	30	31	11 20
175	19	20	21	22	23	24	25	26	27	28	29	30	31	32	11 40
180	20	21	22	23	24	25	26	27	28	29	30	31	32	33	12 0

TABLE XIII.

FOR REDUCING LONGITUDE INTO TIME, AND THE CONTRARY.

°	h. m.	°	h. m.	°	h. m.	°	h. m.	°	h. m.	°	h. m.
′	m. s.	′	m. s.	′	m. s,	′	m. s.	′	m. s	′	m. s.
″	s. t.	″	s. t.	″	s. t.	″	s. t.	″	s. t.	″	s. t.
1	0 4	31	2 4	61	4 4	91	6 4	121	8 4	151	10 4
2	0 8	32	2 8	62	4 8	92	6 8	122	8 8	152	10 8
3	0 12	33	2 12	63	4 12	93	6 12	123	8 12	153	10 12
4	0 16	34	2 16	64	4 16	94	6 16	124	8 16	154	10 16
5	0 20	35	2 20	65	4 20	95	6 20	125	8 20	155	10 20
6	0 24	36	2 24	66	4 24	96	6 24	126	8 24	156	10 24
7	0 28	37	2 28	67	4 28	97	6 28	127	8 28	157	10 28
8	0 32	38	2 32	68	4 32	98	6 32	128	8 32	158	10 32
9	0 36	39	2 36	60	4 36	99	6 36	129	8 36	159	10 36
10	0 40	40	2 40	70	4 40	100	6 40	130	8 40	160	10 40
11	0 44	41	2 44	71	4 44	101	6 44	131	8 44	161	10 44
12	0 48	42	2 48	72	4 48	102	6 48	132	8 48	162	10 48
13	0 52	43	2 52	73	4 52	103	6 52	133	8 52	163	10 52
14	0 56	44	2 56	74	4 56	104	6 56	134	8 56	164	10 56
15	1 0	45	3 0	75	5 0	105	7 0	135	9 0	165	11 0
16	1 4	46	3 4	76	5 4	106	7 4	136	9 4	166	11 4
17	1 8	47	3 8	77	5 8	107	7 8	137	9 8	167	11 8
18	1 12	48	3 12	78	5 12	108	7 12	138	9 12	168	11 12
19	1 16	49	3 16	79	5 16	109	7 16	139	9 16	169	11 16
20	1 20	50	3 20	80	5 20	110	7 20	140	9 20	170	11 20
21	1 24	51	3 24	81	5 24	111	7 24	141	9 24	171	11 24
22	1 28	52	3 28	82	5 28	112	7 28	142	9 28	172	11 28
23	1 32	53	3 32	83	5 32	113	7 32	143	9 32	173	11 32
24	1 36	54	3 36	84	5 36	114	7 36	144	9 36	174	11 36
25	1 40	55	3 40	85	5 40	115	7 40	145	9 40	175	11 40
26	1 44	56	3 44	86	5 44	116	7 44	146	9 44	176	11 44
27	1 48	57	3 48	87	5 48	117	7 48	147	9 48	177	11 48
28	1 52	58	3 52	88	5 52	118	7 52	148	9 52	178	11 52
29	1 56	59	3 56	89	5 56	119	7 56	149	9 56	179	11 56
30	2 0	60	4 0	90	6 0	120	8 0	150	10 0	180	12 0

TABLE XIV.

FOR FINDING THE DISTANCE OF TERRESTRIAL OBJECTS AT SEA.

Height in feet	Dist.in miles.	Height in feet	Dist.in miles.	Height in feet	Dist.in miles.	Height in feet.	Dist.in miles.	Height in feet.	Dist in miles.	Height in feet.	Disi in miles.	Height in feet.	Dist.in miles.
1	1.15	25	5.74	49	8.0	180	15.4	420	23.5	820	32.9	2500	57.4
2	1.62	26	5.86	50	8.1	190	15.8	430	23.8	840	33.3	2600	58.6
3	1.99	27	5.97	55	8.5	200	16.2	440	24.1	860	33.7	2700	59.7
4	2.30	28	6.08	60	8.9	210	16.6	450	24.4	880	34.1	2800	60.8
5	2.57	29	6.18	65	9.3	220	17.0	460	24.6	900	34.5	2900	61.8
6	2.81	30	6.30	70	9.6	230	17.4	470	24.9	920	34.8	3000	63.0
7	3.04	31	6.40	75	9.9	240	17.8	480	25.2	940	35.2	3100	64.0
8	3.25	32	6.50	80	10.3	250	18.2	490	25.4	960	35.6	3200	65.0
9	3.45	33	6.60	85	10.6	260	18.5	500	25.7	980	36.0	3300	66.0
10	3.63	34	6.70	90	10.9	270	18.9	520	26.2	1000	36.3	3400	67.0
11	3.81	35	6.80	95	11.2	280	19.2	540	26.7	1100	38.1	3500	68.0
12	3.98	36	6.90	100	11.5	290	19.6	560	27.2	1200	39.8	3600	69.0
13	4.14	37	6.99	105	11.8	300	19.9	580	27.7	1300	41.4	3700	69.9
14	4.30	38	7.09	110	12.1	310	20.2	600	28.1	1400	43.0	3800	70.9
15	4.45	39	7.17	115	12.3	320	20.6	620	28.6	1500	44.5	3900	71.7
16	4.60	40	7.27	120	12.6	330	20.9	640	29.1	1600	46.0	4000	72.7
17	4.73	41	7.36	125	12.8	340	21.2	660	29.5	1700	47.3	4100	73.6
18	4.87	42	7.44	130	13.1	350	21.5	680	30.0	1800	48.7	4200	74.4
19	5.01	43	7.54	135	13.3	360	21.8	700	30.4	1900	50.1	4300	75.4
20	5.14	44	7.62	140	13.6	370	22.1	720	30.8	2000	51.4	4400	76.2
21	5.26	45	7.70	145	13.8	380	22.4	740	31.2	2100	52.6	4500	77.0
22	5.39	46	7.79	150	14.1	390	22.7	760	31.7	2200	53.9	4700	78.8
23	5.51	47	7.88	160	14.5	400	23.0	780	32.1	2300	55.1	5000	81.2
24	5.62	48	7.96	170	15.0	410	23.3	800	32.5	2400	56.2	1 mile	83.5

TABLE XV.

For reducing the SUN'S DECLINATION to any given Meridian, and to any Time under that Meridian.

When Sun's dec is increasing. { add in W. lon. sub. in E. lon. } Add aft. noon. Sub. bef. noon | When Sun's dec is decreasing. { sub. in W lon. add in E. lon. } Sub. aft noon Add bef. noon

Long	SUN'S DECLINATION.												Time fr Noon.
	0°	2°	4°	6°	8°	9°	10°	11°	12°	13°	14°	15°	
0°	0′ 0″	0′ 0″	0′ 0″	0′ 0″	0′ 0″	0′ 0″	0′ 0″	0′ 0″	0′ 0″	0′ 0″	0′ 0″	0′ 0″	0h 0m
3	0 12	0 12	0 12	0 11	0 11	0 11	0 11	0 11	0 10	0 10	0 9	0 9	0 12
6	0 24	0 24	0 24	0 23	0 23	0 22	0 22	0 21	0 20	0 20	0 18	0 18	0 24
9	0 35	0 35	0 35	0 34	0 34	0 33	0 32	0 32	0 31	0 30	0 28	0 27	0 36
12	0 47	0 47	0 47	0 46	0 45	0 44	0 43	0 42	0 41	0 40	0 38	0 37	0 48
15	0 59	0 59	0 58	0 57	0 56	0 55	0 54	0 53	0 51	0 50	0 48	0 46	1 0
18	1 11	1 10	1 10	1 9	1 7	1 6	1 5	1 3	1 1	1 0	0 58	0 55	1 12
21	1 22	1 22	1 22	1 21	1 18	1 17	1 16	1 14	1 12	1 9	1 7	1 5	1 24
24	1 34	1 34	1 33	1 32	1 29	1 28	1 27	1 24	1 22	1 19	1 17	1 14	1 36
27	1 46	1 45	1 44	1 45	1 41	1 39	1 38	1 35	1 32	1 29	1 27	1 23	1 48
30	1 58	1 57	1 56	1 54	1 51	1 49	1 48	1 45	1 43	1 39	1 36	1 32	2 0
33	2 10	2 10	2 8	2 6	2 3	2 1	1 59	1 55	1 53	1 49	1 46	1 42	2 12
36	2 22	2 21	2 19	2 17	2 14	2 12	2 10	2 6	2 3	1 59	1 56	1 51	2 24
39	2 33	2 32	2 31	2 29	2 25	2 23	2 20	2 16	2 14	2 9	2 5	2 1	2 36
42	2 45	2 44	2 43	2 40	2 36	2 34	2 31	2 27	2 24	2 19	2 15	2 10	2 48
45	2 57	2 56	2 54	2 51	2 47	2 44	2 41	2 38	2 34	2 29	2 24	2 19	3 0
48	3 9	3 8	3 6	3 3	2 59	2 55	2 52	2 49	2 44	2 39	2 34	2 28	3 12
51	3 20	3 19	3 18	3 15	3 10	3 6	3 3	3 0	2 55	2 49	2 44	2 38	3 24
54	3 32	3 31	3 30	3 26	3 21	3 17	3 14	3 10	3 5	2 59	2 53	2 47	3 36
57	3 43	3 42	3 41	3 37	3 32	3 28	3 25	3 21	3 15	3 9	3 3	2 56	3 48
60	3 55	3 54	3 52	3 48	3 43	3 39	3 35	3 31	3 25	3 19	3 13	3 5	4 0
63	4 7	4 6	4 4	4 0	3 54	3 50	3 46	3 42	3 35	3 29	3 22	3 14	4 12
66	4 19	4 18	4 16	4 12	4 5	4 1	3 57	3 52	3 46	3 39	3 32	3 23	4 24
69	4 31	4 30	4 27	4 23	4 16	4 12	4 8	4 3	3 56	3 49	3 42	3 32	4 36
72	4 43	4 42	4 39	4 34	4 27	4 23	4 19	4 13	4 6	3 59	3 51	3 41	4 48
75	4 54	4 53	4 50	4 45	4 38	4 34	4 29	4 23	4 16	4 9	4 1	3 51	5 0
78	5 6	5 5	5 2	4 57	4 50	4 45	4 40	4 34	4 27	4 19	4 11	4 0	5 12
81	5 18	5 17	5 14	5 9	5 1	4 56	4 51	4 44	4 37	4 29	4 20	4 9	5 24
84	5 30	5 28	5 26	5 20	5 12	5 7	5 2	4 55	4 47	4 39	4 30	4 18	5 36
87	5 41	5 40	5 37	5 31	5 23	5 18	5 13	5 5	4 58	4 49	4 40	4 27	5 48
90	5 53	5 52	5 48	5 42	5 34	5 29	5 23	5 16	5 8	4 59	4 49	4 37	6 0
93	6 5	6 4	6 0	5 54	5 46	5 41	5 34	5 27	5 18	5 9	4 59	4 46	6 12
96	6 17	6 15	6 12	6 6	5 57	5 52	5 45	5 37	5 28	5 19	5 9	4 55	6 24
99	6 28	6 27	6 23	6 17	6 8	6 3	5 56	5 48	5 39	5 29	5 18	5 5	6 36
102	6 40	6 39	6 35	6 28	6 19	6 14	6 7	5 58	5 49	5 39	5 28	5 14	6 48
105	6 52	6 51	6 46	6 39	6 30	6 24	6 17	6 9	5 59	5 49	5 37	5 23	7 0
108	7 4	7 2	6 58	6 51	6 41	6 35	6 28	6 19	6 9	5 59	5 47	5 32	7 12
111	7 15	7 14	7 10	7 3	6 52	6 46	6 39	6 30	6 20	6 9	5 56	5 42	7 24
114	7 27	7 26	7 22	7 15	7 3	6 57	6 50	6 40	6 30	6 19	6 6	5 51	7 36
117	7 39	7 37	7 33	7 26	7 14	7 8	7 1	6 51	6 40	6 29	6 15	6 1	7 48
120	7 51	7 49	7 44	7 37	7 25	7 18	7 11	7 1	6 51	6 39	6 25	6 10	8 0
123	8 3	8 1	7 56	7 49	7 37	7 29	7 22	7 12	7 1	6 49	6 35	6 19	8 12
126	8 14	8 13	8 8	8 0	7 48	7 40	7 33	7 22	7 11	6 59	6 44	6 28	8 24
129	8 26	8 24	8 20	8 11	7 59	7 51	7 43	7 33	7 22	7 9	6 54	6 37	8 36
132	8 38	8 36	8 31	8 22	8 10	8 2	8 54	7 43	7 32	7 18	7 4	6 46	8 48
135	8 50	8 48	8 42	8 33	8 21	8 13	8 4	7 54	7 42	7 28	7 13	6 56	9 0
138	9 1	8 59	8 54	8 45	8 33	8 24	8 15	8 5	7 52	7 38	7 23	7 5	9 12
141	9 13	9 11	9 6	8 57	8 44	8 35	8 26	8 15	8 3	7 48	7 33	7 14	9 24
144	9 25	9 23	9 18	9 8	8 55	8 46	8 37	8 26	8 13	7 58	7 42	7 23	9 36
147	9 37	9 35	9 29	9 19	9 6	8 57	8 48	8 36	8 23	8 8	7 52	7 32	9 48
150	9 48	9 45	9 40	9 30	9 17	9 8	8 58	8 47	8 33	8 18	8 2	7 42	10 0
153	10 0	9 57	9 52	9 42	9 28	9 19	9 9	8 57	8 43	8 28	8 12	7 51	10 12
156	10 12	10 9	10 4	9 54	9 39	9 30	9 20	9 8	8 54	8 38	8 21	8 0	10 24
159	10 24	10 21	10 16	10 5	9 50	9 41	9 31	9 18	9 4	8 48	8 31	8 10	10 36
162	10 36	10 33	10 27	10 16	10 1	9 52	9 42	9 29	9 14	8 58	8 41	8 19	10 48
165	10 47	10 44	10 38	10 27	10 12	10 3	9 52	9 39	9 24	9 8	8 50	8 28	11 00
168	10 59	10 56	10 50	10 39	10 24	10 14	10 3	9 50	9 35	9 18	9 0	8 38	11 12
171	11 11	11 8	11 2	10 51	10 35	10 25	10 14	10 0	9 45	9 28	9 10	8 47	11 24
174	11 23	11 20	11 14	11 3	10 46	10 36	10 25	10 11	9 55	9 38	9 19	8 57	11 36
177	11 34	11 31	11 25	11 14	10 57	10 47	10 36	10 21	10 6	9 48	9 29	9 6	11 48
180	11 46	11 43	11 37	11 25	11 08	10 58	10 46	10 32	10 16	9 58	9 38	9 15	12 0

TABLE XV.

For reducing the SUN'S DECLINATION to any given Meridian, and to any Time under that Meridian.

When Sun's dec. in increasing,	add in W. lon., sub. in E. lon.	Add aft. noon. Sub. bef. noon.	When Sun's dec is decreasing.	sub. in W. lon add in E. lon.	Sub. aft. noon. Add bef. noon.

Lon.	SUN'S DECLINATION.														Timefr Noon
	16°	17°	18°	19°	19°30′	20°	20°30′	21°	21°30′	22°	22°30′	23°	23°15	23°28	
0°	0′ 0″	0′ 0″	0′ 0″	0′ 0″	0′ 0″	0′ 0″	0′ 0″	0′ 0″	0′ 0″	0′ 0″	0′ 0″	0′ 0″	0′ 0″	0′ 0″	0h 0m
3	0 9	0 8	0 8	0 7	0 7	0 6	0 6	0 5	0 5	0 4	0 3	0 2	0 2	0 0	0 12
6	0 18	0 16	0 16	0 14	0 13	0 12	0 11	0 10	0 9	0 8	0 6	0 4	0 4	0 0	0 24
9	0 27	0 24	0 24	0 21	0 20	0 18	0 17	0 15	0 14	0 12	0 10	0 7	0 5	0 0	0 36
12	0 36	0 32	0 31	0 28	0 27	0 25	0 23	0 21	0 19	0 16	0 14	0 9	0 7	0 0	0 48
15	0 44	0 41	0 39	0 35	0 34	0 32	0 29	0 27	0 24	0 21	0 18	0 12	0 9	0 0	1 0
18	0 53	0 49	0 46	0 42	0 40	0 38	0 35	0 32	0 29	0 25	0 21	0 14	0 10	0 0	1 12
21	1 2	0 57	0 54	0 49	0 47	0 44	0 41	0 38	0 34	0 29	0 24	0 17	0 12	0 0	1 24
24	1 11	1 5	1 2	0 56	0 54	0 50	0 47	0 44	0 39	0 34	0 28	0 19	0 14	0 0	1 36
27	1 20	1 14	1 10	1 3	1 1	0 57	0 53	0 50	0 44	0 39	0 32	0 22	0 15	0 0	1 48
30	1 28	1 23	1 18	1 11	1 8	1 4	0 59	0 55	0 49	0 43	0 36	0 25	0 17	0 0	2 0
33	1 37	1 31	1 25	1 18	1 14	1 10	1 4	1 0	0 53	0 47	0 39	0 27	0 19	0 0	2 12
36	1 46	1 39	1 33	1 25	1 21	1 16	1 10	1 5	0 58	0 51	0 42	0 30	0 20	0 0	2 24
39	1 55	1 47	1 41	1 32	1 28	1 22	1 16	1 10	1 3	0 55	0 46	0 32	0 22	0 0	2 36
42	2 4	1 56	1 49	1 39	1 35	1 29	1 22	1 16	1 8	0 59	0 50	0 34	0 24	0 0	2 48
45	2 12	2 5	1 57	1 46	1 42	1 36	1 28	1 22	1 13	1 4	0 54	0 36	0 25	0 0	3 0
48	2 21	2 13	2 4	1 53	1 48	1 42	1 33	1 27	1 18	1 8	0 57	0 39	0 27	0 0	3 12
51	2 30	2 21	2 12	2 0	1 55	1 48	1 39	1 32	1 23	1 12	1 0	0 42	0 29	0 0	3 24
54	2 39	2 29	2 20	2 7	2 2	1 54	1 45	1 38	1 28	1 16	1 3	0 44	0 30	0 0	3 36
57	2 48	2 38	2 28	2 15	2 9	2 1	1 52	1 44	1 33	1 21	1 7	0 47	0 32	0 0	3 48
60	2 56	2 47	2 36	2 23	2 16	2 8	1 59	1 49	1 39	1 26	1 11	0 49	0 34	0 0	4 0
63	3 5	2 55	2 43	2 29	2 22	2 14	2 4	1 54	1 43	1 30	1 14	0 51	0 35	0 0	4 12
66	3 14	3 3	2 51	2 36	2 29	2 20	2 10	1 59	1 48	1 34	1 17	0 54	0 37	0 0	4 24
69	3 23	3 11	2 59	2 43	2 36	2 26	2 16	2 4	1 53	1 38	1 21	0 56	0 39	0 0	4 36
72	3 32	3 19	3 7	2 50	2 43	2 33	2 21	2 10	1 58	1 42	1 25	0 59	0 40	0 0	4 48
75	3 40	3 28	3 15	2 58	2 50	2 40	2 27	2 16	2 3	1 47	1 29	1 1	0 42	0 0	5 0
78	3 49	3 36	3 22	3 5	2 56	2 46	2 33	2 21	2 8	1 51	1 32	1 4	0 44	0 0	5 12
81	3 58	3 44	3 30	3 12	3 3	2 52	2 39	2 26	2 13	1 55	1 35	1 6	0 45	0 0	5 24
84	4 7	3 52	3 38	3 19	3 10	2 58	2 45	2 32	2 18	1 59	1 39	1 9	0 47	0 0	5 36
87	4 16	4 1	3 46	3 26	3 17	3 5	2 52	2 38	2 23	2 4	1 43	1 11	0 49	0 0	5 48
90	4 25	4 10	3 54	3 34	3 24	3 12	2 59	2 44	2 28	2 9	1 47	1 14	0 50	0 0	6 0
93	4 34	4 18	4 1	3 41	3 30	3 18	3 4	2 49	2 32	2 13	1 50	1 16	0 52	0 0	6 12
96	4 43	4 26	4 9	3 48	3 37	3 24	3 9	2 54	2 37	2 17	1 53	1 19	0 54	0 0	6 24
99	4 52	4 34	4 17	3 55	3 44	3 30	3 15	2 59	2 42	2 21	1 57	1 21	0 55	0 0	6 36
102	5 0	4 43	4 25	4 2	3 51	3 37	3 21	3 5	2 47	2 25	2 1	1 24	0 57	0 0	6 48
105	5 8	4 52	4 33	4 9	3 58	3 44	3 27	3 11	2 52	2 30	2 5	1 26	0 59	0 0	7 0
108	5 17	5 0	4 40	4 16	4 4	3 50	3 33	3 16	2 57	2 34	2 9	1 29	1 0	0 0	7 12
111	5 26	5 8	4 48	4 23	4 11	3 56	3 39	3 21	3 2	2 38	2 12	1 31	1 2	0 0	7 24
114	5 35	5 16	4 56	4 30	4 18	4 2	3 46	3 27	3 7	2 43	2 16	1 34	1 4	0 0	7 36
117	5 44	5 25	5 4	4 38	4 25	4 9	3 52	3 33	3 12	2 48	2 20	1 37	1 5	0 0	7 48
120	5 53	5 34	5 12	4 46	4 32	4 16	3 59	3 39	3 17	2 53	2 23	1 39	1 7	0 0	8 0
123	6 2	5 42	5 19	4 53	4 38	4 22	4 4	3 44	3 22	2 57	2 26	1 41	1 9	0 0	8 12
126	6 11	5 50	5 27	5 0	4 45	4 28	4 10	3 49	3 27	3 1	2 29	1 44	1 10	0 0	8 24
129	6 19	5 58	5 35	5 7	4 52	4 34	4 16	3 54	3 32	3 5	2 33	1 46	1 12	0 0	8 36
132	6 28	6 6	5 43	5 14	4 59	4 41	4 22	3 59	3 37	3 9	2 36	1 49	1 14	0 0	8 48
135	6 36	6 15	5 51	5 21	5 6	4 48	4 28	4 5	3 42	3 13	2 40	1 51	1 15	0 0	9 0
138	6 45	6 23	5 58	5 28	5 12	4 54	4 34	4 10	3 47	3 17	2 43	1 54	1 17	0 0	9 12
141	6 54	6 31	6 6	5 35	5 19	5 0	4 40	4 15	3 52	3 21	2 46	1 56	1 19	0 0	9 24
144	7 3	6 39	6 14	5 42	5 26	5 6	4 46	4 21	3 57	3 26	2 50	1 59	1 20	0 0	9 36
147	7 12	6 48	6 22	5 49	5 33	5 13	4 52	4 27	4 2	3 30	2 54	2 1	1 22	0 0	9 48
150	7 21	6 57	6 30	5 57	5 40	5 20	4 58	4 33	4 7	3 35	2 58	2 4	1 24	0 0	10 0
153	7 30	7 5	6 37	6 4	5 46	5 26	5 3	4 38	4 11	3 39	3 1	2 6	1 25	0 0	10 12
156	7 39	7 13	6 45	6 11	5 53	5 32	5 9	4 43	4 16	3 43	3 4	2 9	1 27	0 0	10 24
159	7 48	7 21	6 53	6 18	6 0	5 38	5 15	4 48	4 21	3 47	3 8	2 11	1 29	0 0	10 36
162	7 57	7 29	7 1	6 25	6 7	5 45	5 21	4 54	4 26	3 51	3 12	2 13	1 30	0 0	10 48
165	8 5	7 38	7 9	8 32	6 14	5 52	5 26	5 0	4 31	3 56	3 16	2 15	1 32	0 0	11 0
168	8 14	7 46	7 16	6 39	6 20	5 58	5 32	5 6	4 36	4 0	3 19	2 17	1 34	0 0	11 12
171	8 23	7 54	7 24	6 46	6 27	6 4	5 38	5 11	4 41	4 4	3 22	2 20	1 35	0 0	11 24
174	8 32	8 3	7 32	6 53	6 34	6 10	5 44	5 17	4 46	4 9	3 26	2 22	1 37	0 0	11 36
177	8 41	8 12	7 40	7 1	6 41	6 17	5 51	5 23	4 51	4 14	3 30	2 25	1 39	0 0	11 48
180	8 49	8 21	7 48	7 9	6 48	6 24	5 58	5 29	4 56	4 19	3 34	2 28	1 40	0 0	12 0

TABLE XVI.

To reduce the SUN'S RIGHT ASCENSION to any given Meridian, and to any Time under that Meridian.

{ Add in W. long.
{ Sub. in E. long.

{ Add aft. noon.
{ Sub. bef. noon

Long.	SUN'S RIGHT ASCENSION.												Time fr. Noon.
	0h.	1h.	2h.	3h.	4h.	5h.	6h.	7h.	8h.	9h.	10h.	11h.	
°	m. s	m. s	m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	m s.	h. m.
0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
3	0 2	0 2	0 2	0 2	0 2	0 2	0 2	0 2	0 2	0 2	0 2	0 2	0 12
6	0 4	0 4	0 4	0 4	0 4	0 4	0 4	0 4	0 4	0 4	0 4	0 4	0 24
9	0 6	0 6	0 6	0 6	0 6	0 6	0 6	0 6	0 6	0 6	0 6	0 5	0 36
12	0 7	0 7	0 7	0 8	0 8	0 8	0 8	0 8	0 8	0 8	0 7	0 7	0 48
15	0 9	0 9	0 9	0 10	0 10	0 10	0 10	0 10	0 10	0 10	0 9	0 9	1 0
18	0 11	0 11	0 11	0 12	0 12	0 12	0 12	0 12	0 12	0 11	0 11	0 11	1 12
21	0 13	0 13	0 13	0 14	0 14	0 14	9 14	0 14	0 14	0 13	0 13	0 13	1 24
24	0 15	0 15	0 15	0 15	0 16	0 16	0 17	0 16	0 16	0 15	0 15	0 14	1 36
27	0 16	0 16	0 17	0 17	0 18	0 18	0 19	0 18	0 18	0 17	0 17	0 16	1 48
30	0 18	0 18	0 19	0 19	0 20	0 21	0 21	0 21	0 20	0 19	0 18	0 18	2 0
33	0 20	0 20	0 21	0 21	0 22	0 23	0 23	0 23	0 22	0 21	0 20	0 20	2 12
36	0 22	0 22	0 22	0 23	0 24	0 25	0 25	0 25	0 24	0 23	0 22	0 22	2 24
39	0 24	0 24	0 24	0 25	0 26	0 27	0 27	0 27	0 26	0 25	0 24	0 23	2 36
42	0 25	0 25	0 26	0 27	0 28	0 29	0 29	0 29	0 28	0 27	0 26	0 25	2 48
45	0 27	0 27	0 28	0 29	0 30	0 31	0 31	0 31	0 30	0 29	0 28	0 27	3 0
48	0 29	0 29	0 30	0 31	0 32	0 33	0 33	0 33	0 32	0 31	0 30	0 29	3 12
51	0 31	0 31	0 32	0 33	0 34	0 35	0 35	0 35	0 34	0 33	0 32	0 31	3 24
54	0 33	0 33	0 34	0 35	0 36	0 37	0 37	0 37	0 36	0 35	0 33	0 32	3 36
57	0 35	0 35	0 36	0 37	0 38	0 39	0 39	0 39	0 38	0 36	0 35	0 34	3 48
60	0 36	0 36	0 37	0 39	0 40	0 41	0 42	0 41	0 40	0 38	0 37	0 36	4 0
63	0 38	0 38	0 39	0 41	0 42	0 43	0 44	0 43	0 42	0 40	0 39	0 38	4 12
66	0 40	0 40	0 41	0 43	0 44	0 45	0 46	0 45	0 44	0 42	0 41	0 40	4 24
69	0 42	0 42	0 43	0 45	0 46	0 47	0 48	0 47	0 46	0 44	0 42	0 41	4 36
72	0 44	0 44	0 45	0 46	0 48	0 49	0 50	0 49	0 48	0 46	0 44	0 43	4 48
75	0 45	0 46	0 47	0 48	0 50	0 51	0 52	0 51	0 50	0 48	0 46	0 45	5 0
78	0 47	0 47	0 49	0 50	0 52	0 54	0 54	0 53	0 52	0 50	0 48	0 47	5 12
81	0 49	0 49	0 50	0 52	0 54	0 56	0 56	0 55	0 54	0 52	0 50	0 49	5 24
84	0 51	0 51	0 52	0 54	0 56	0 58	0 58	0 58	0 56	0 54	0 52	0 50	5 36
87	0 53	0 53	0 54	0 56	0 58	1 0	1 0	1 0	0 58	0 56	0 54	0 52	5 48
90	0 54	0 55	0 56	0 58	1 0	1 2	1 2	1 2	1 0	0 58	0 55	0 54	6 0
93	0 56	0 56	0 58	1 0	1 2	1 4	1 4	1 4	1 2	1 0	0 57	0 56	6 12
96	0 58	0 58	1 0	1 2	1 4	1 6	1 6	1 6	1 4	1 2	0 59	0 58	6 24
99	1 0	1 0	1 2	1 4	1 6	1 8	1 9	1 8	1 6	1 3	1 1	0 59	6 36
102	1 2	1 2	1 3	1 6	1 8	1 10	1 11	1 10	1 8	1 5	1 3	1 1	6 48
105	1 4	1 4	1 5	1 8	1 10	1 12	1 13	1 12	1 10	1 7	1 5	1 3	7 0
108	1 5	1 6	1 7	1 10	1 12	1 14	1 15	1 14	1 12	1 9	1 7	1 5	7 12
111	1 7	1 7	1 9	1 12	1 14	1 16	1 17	1 16	1 14	1 11	1 8	1 7	7 24
114	1 9	1 9	1 11	1 14	1 16	1 18	1 19	1 18	1 16	1 13	1 10	1 9	7 36
117	1 11	1 11	1 13	1 16	1 18	1 20	1 21	1 20	1 18	1 15	1 12	1 10	7 48
120	1 13	1 13	1 15	1 17	1 20	1 22	1 23	1 22	1 20	1 17	1 14	1 12	8 0
123	1 14	1 15	1 17	1 19	1 22	1 25	1 25	1 24	1 22	1 19	1 16	1 14	8 12
126	1 16	1 16	1 18	1 21	1 24	1 27	1 27	1 26	1 24	1 21	1 18	1 16	8 24
129	1 18	1 18	1 20	1 23	1 26	1 29	1 29	1 28	1 26	1 23	1 19	1 18	8 36
132	1 20	1 20	1 22	1 25	1 28	1 31	1 31	1 30	1 28	1 25	1 21	1 19	8 48
135	1 22	1 22	1 24	1 27	1 30	1 33	1 34	1 32	1 30	1 26	1 23	1 21	9 0
138	1 24	1 24	1 26	1 29	1 32	1 35	1 36	1 35	1 32	1 28	1 25	1 23	9 12
141	1 26	1 26	1 28	1 31	1 34	1 37	1 38	1 37	1 34	1 30	1 27	1 25	9 24
144	1 27	1 27	1 30	1 33	1 36	1 39	1 40	1 39	1 36	1 32	1 29	1 27	9 36
147	1 29	1 29	1 32	1 35	1 38	1 41	1 42	1 41	1 38	1 34	1 31	1 28	9 48
150	1 31	1 31	1 33	1 37	1 40	1 43	1 44	1 43	1 40	1 36	1 32	1 30	10 0
153	1 33	1 33	1 35	1 39	1 42	1 45	1 46	1 45	1 42	1 38	1 34	1 32	10 12
156	1 34	1 35	1 37	1 41	1 44	1 47	1 48	1 47	1 44	1 40	1 36	1 34	10 24
159	1 36	1 37	1 39	1 43	1 46	1 49	1 50	1 49	1 46	1 42	1 38	1 36	10 36
162	1 38	1 38	1 41	1 45	1 48	1 51	1 52	1 51	1 48	1 44	1 40	1 37	10 48
165	1 40	1 40	1 43	1 46	1 50	1 53	1 54	1 53	1 50	1 46	1 42	1 39	11 0
168	1 42	1 42	1 45	1 48	1 52	1 55	1 56	1 55	1 52	1 48	1 44	1 41	11 12
171	1 44	1 44	1 46	1 50	1 54	1 57	1 59	1 57	1 54	1 49	1 45	1 43	11 24
174	1 45	1 46	1 48	1 52	1 57	2 0	2 1	1 59	1 56	1 51	1 47	1 45	11 36
177	1 47	1 48	1 50	1 54	1 59	2 2	2 3	2 1	1 58	1 53	1 49	1 46	11 48
180	1 49	1 49	1 52	1 56	2 1	2 4	2 5	2 3	2 0	1 55	1 51	1 48	12 0

TABLE XVI.

To reduce the SUN'S RIGHT ASCENSION to any given Meridian, and to any Time under that Meridian.

{ Add in W. long. }
{ Sub. in E. long }

{ Add aft. noon. }
{ Sub. bef. noon. }

Long.	SUN'S RIGHT ASCENSION. 12h.	13h.	14h.	15h.	16h.	17h.	18h.	19h.	20h.	21h.	22h.	23h.	Time fr. Noon.
°	m. s.	m. s	m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	m. s	m. s.	m. s.	h. m.
0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
3	0 2	0 2	0 2	0 2	0 2	0 2	0 2	0 2	0 2	0 2	0 2	0 2	0 12
6	0 4	0 4	0 4	0 4	0 4	0 4	0 5	0 4	0 4	0 4	0 4	0 4	0 24
9	0 5	0 5	0 6	0 6	0 6	0 7	0 7	0 7	0 6	0 6	0 6	0 6	0 36
12	0 7	0 7	0 8	0 8	0 8	0 9	0 9	0 9	0 8	0 8	0 8	0 7	0 48
15	0 9	0 9	0 10	0 10	0 11	0 11	0 11	0 11	0 11	0 10	0 10	0 9	1 0
18	0 11	0 11	0 11	0 12	0 13	0 13	0 13	0 13	0 13	0 12	0 12	0 11	1 12
21	0 13	0 13	0 13	0 14	0 15	0 15	0 16	0 15	0 15	0 14	0 14	0 13	1 24
24	0 14	0 15	0 15	0 16	0 17	0 17	0 18	0 18	0 17	0 16	0 15	0 15	1 36
27	0 16	0 17	0 17	0 18	0 19	0 20	0 20	0 20	0 19	0 18	0 17	0 17	1 48
30	0 18	0 18	0 19	0 20	0 21	0 22	0 22	0 22	0 21	0 20	0 19	0 19	2 0
33	0 20	0 20	0 21	0 22	0 23	0 24	0 24	0 24	0 23	0 22	0 21	0 21	2 12
36	0 22	0 22	0 23	0 24	0 25	0 26	0 27	0 26	0 26	0 24	0 23	0 23	2 24
39	0 23	0 24	0 25	0 26	0 27	0 28	0 29	0 29	0 28	0 26	0 25	0 24	2 36
42	0 25	0 26	0 27	0 28	0 30	0 31	0 31	0 31	0 30	0 28	0 27	0 26	2 48
45	0 27	0 28	0 29	0 30	0 32	0 33	0 33	0 33	0 32	0 30	0 29	0 28	3 0
48	0 29	0 29	0 31	0 32	0 34	0 35	0 35	0 35	0 34	0 32	0 31	0 30	3 12
51	0 31	0 31	0 33	0 34	0 36	0 37	0 38	0 37	0 36	0 35	0 33	0 32	3 24
54	0 32	0 33	0 34	0 36	0 38	0 39	0 40	0 40	0 38	0 37	0 35	0 34	3 36
57	0 34	0 34	0 36	0 38	0 40	0 42	0 42	0 42	0 40	0 39	0 37	0 36	3 48
60	0 36	0 37	0 38	0 40	0 42	0 44	0 44	0 44	0 43	0 41	0 39	0 37	4 0
63	0 38	0 39	0 40	0 42	0 44	0 46	0 47	0 46	0 45	0 43	0 41	0 39	4 12
66	0 40	0 40	0 42	0 44	0 47	0 48	0 49	0 48	0 47	0 45	0 43	0 41	4 24
69	0 41	0 42	0 44	0 46	0 49	0 50	0 51	0 51	0 49	0 47	0 44	0 43	4 36
72	0 43	0 44	0 46	0 48	0 51	0 53	0 53	0 53	0 51	0 49	0 46	0 45	4 48
75	0 45	0 46	0 48	0 50	0 53	0 55	0 56	0 55	0 53	0 51	0 48	0 47	5 0
78	0 47	0 48	0 50	0 52	0 55	0 57	0 58	0 57	0 55	0 53	0 50	0 49	5 12
81	0 49	0 50	0 52	0 54	0 57	0 59	1 0	0 59	0 58	0 55	0 52	0 51	5 24
84	0 50	0 51	0 54	0 56	0 59	1 1	1 2	1 2	1 0	0 57	0 54	0 52	5 36
87	0 52	0 53	0 56	0 59	1 1	1 4	1 4	1 4	1 2	0 59	0 56	0 54	5 48
90	0 54	0 55	0 58	1 1	1 4	1 6	1 7	1 6	1 4	1 1	0 58	0 56	6 0
93	0 56	0 57	0 59	1 3	1 6	1 8	1 9	1 8	1 6	1 3	1 0	0 58	6 12
96	0 58	0 59	1 1	1 5	1 8	1 10	1 11	1 10	1 8	1 5	1 2	1 0	6 24
99	0 59	1 1	1 3	1 7	1 10	1 12	1 13	1 13	1 10	1 7	1 4	1 2	6 36
102	1 1	1 2	1 5	1 9	1 12	1 15	1 16	1 15	1 12	1 9	1 6	1 4	6 48
105	1 3	1 4	1 7	1 11	1 14	1 17	1 18	1 17	1 14	1 11	1 8	1 6	7 0
108	1 5	1 6	1 9	1 13	1 16	1 19	1 20	1 19	1 17	1 13	1 10	1 7	7 12
111	1 7	1 8	1 11	1 15	1 18	1 21	1 22	1 21	1 19	1 15	1 12	1 9	7 24
114	1 8	1 10	1 13	1 17	1 20	1 23	1 24	1 24	1 21	1 17	1 14	1 11	7 36
117	1 10	1 12	1 15	1 19	1 23	1 25	1 27	1 26	1 23	1 19	1 16	1 13	7 48
120	1 12	1 13	1 17	1 21	1 25	1 28	1 29	1 28	1 25	1 21	1 17	1 15	8 0
123	1 14	1 15	1 19	1 23	1 27	1 30	1 31	1 30	1 27	1 23	1 19	1 17	8 12
126	1 16	1 17	1 21	1 25	1 29	1 32	1 33	1 32	1 29	1 25	1 21	1 19	8 24
129	1 17	1 19	1 22	1 27	1 31	1 34	1 36	1 35	1 32	1 27	1 23	1 21	8 36
132	1 19	1 21	1 21	1 29	1 33	1 36	1 38	1 37	1 34	1 29	1 25	1 22	8 48
135	1 21	1 23	1 26	1 31	1 35	1 39	1 40	1 39	1 36	1 31	1 27	1 24	9 0
138	1 23	1 25	1 28	1 33	1 37	1 41	1 42	1 41	1 38	1 33	1 29	1 26	9 12
141	1 25	1 26	1 30	1 35	1 40	1 43	1 44	1 43	1 40	1 36	1 31	1 28	9 24
144	1 26	1 28	1 32	1 37	1 42	1 45	1 47	1 46	1 42	1 38	1 33	1 30	9 36
147	1 28	1 30	1 34	1 39	1 44	1 47	1 49	1 48	1 44	1 40	1 35	1 32	9 48
150	1 30	1 32	1 36	1 41	1 46	1 50	1 51	1 50	1 46	1 42	1 37	1 34	10 0
153	1 32	1 34	1 38	1 43	1 48	1 52	1 53	1 52	1 49	1 44	1 39	1 36	10 12
156	1 34	1 36	1 40	1 45	1 50	1 54	1 56	1 54	1 51	1 46	1 41	1 38	10 24
159	1 35	1 37	1 42	1 47	1 52	1 56	1 58	1 57	1 53	1 48	1 43	1 39	10 36
162	1 37	1 39	1 44	1 49	1 54	1 58	2 0	1 59	1 55	1 50	1 45	1 41	10 48
165	1 39	1 41	1 46	1 51	1 57	2 1	2 2	2 1	1 57	1 52	1 46	1 43	11 0
168	1 41	1 43	1 47	1 53	1 59	2 3	2 4	2 3	1 59	1 54	1 48	1 45	11 12
171	1 43	1 45	1 49	1 55	2 1	2 5	2 7	2 5	2 1	1 56	1 50	1 47	11 24
174	1 44	1 47	1 51	1 57	2 3	2 7	2 9	2 8	2 4	1 58	1 52	1 49	11 36
177	1 46	1 48	1 53	1 59	2 5	2 9	2 11	2 10	2 6	2 0	1 54	1 51	11 48
180	1 48	1 50	1 55	2 1	2 7	2 12	2 13	2 12	2 8	2 2	1 56	1 52	12 0

TABLE XVII.

LOGARITHMIC SINES, TANGENTS, AND SECANTS, to every Point and Quarter Point of the Compass.

Points.	Sine.	Co-sine.	Tangent.	Co-tang.	Secant.	Co-sec.	Points.
0	.0000000	10.000000	0.000000	Infinite.	10.000000	Infinite.	8
0 ¼	8.690796	9.999477	8.691319	11.308681	10.000523	11.309204	7 ¾
0 ½	8.991302	9.997904	9.993398	11.006602	10.002096	11.008698	7 ½
0 ¾	9.166520	9.995274	9.171247	10.828753	10.004726	10.833480	7 ¼
1	9.290236	9.991574	9.298662	10.701338	10.008426	10.709764	7
1 ¼	9.385571	9.986786	9.398785	10.601215	10.013214	10.614429	6 ¾
1 ½	9.462824	9.980885	9.481939	10.518061	10.019115	10.537176	6 ½
1 ¾	9.527488	9.973841	9.553647	10.446353	10.026159	10.472512	6 ¼
2	9.582840	9.965615	9.617224	10.382776	10.034385	10.417160	6
2 ¼	9.630992	9.956163	9.674829	10.325171	10.043837	10.369008	5 ¾
2 ½	9.673387	9.945430	9.727957	10.272043	10.054570	10.326613	5 ½
2 ¾	9.711050	9.933350	9.777700	10.222300	10.066650	10.288950	5 ¼
3	9.744739	9.919846	9.824893	10.175107	10.080154	10.255261	5
3 ¼	9.775027	9.904828	9.870199	10.129801	10.095172	10.224973	4 ¾
3 ½	9.802359	9.888185	9.914173	10.085827	10.111815	10.197641	4 ½
3 ¾	9.827084	9.869790	9.957295	10.042705	10.130210	10.172916	4 ¼
4	9.849485	9.849485	10.000000	10.000000	10.150515	10.150514	4
	Co-sine.	Sine.	Co-tang.	Tangent.	Co-sec.	Secant.	

TABLE XVIII.

LOGARITHMS OF NUMBERS.

No. 1 —— 100 Log. 0.000000 —— 2.000000

No.	Log.	No.	Log.	No.	Log.	No.	Log.	No.	Log.
1	0.000000	21	1.322219	41	1.612784	61	1.785330	81	1.908485
2	0.301030	22	1.342423	42	1.623249	62	1.792392	82	1.913814
3	0.477121	23	1.361728	43	1.633468	63	1.799341	83	1.919078
4	0.602060	24	1.380211	44	1.643453	64	1.806180	84	1.924279
5	0.698970	25	1.397940	45	1.653213	65	1.812913	85	1.929419
6	0.778151	26	1.414973	46	1.662758	66	1.819544	86	1.934498
7	0.845098	27	1.431364	47	1.672098	67	1.826075	87	1.939519
8	0.903090	28	1.447158	48	1.681241	68	1.832509	88	1.944483
9	0.954243	29	1.462398	49	1.690196	69	1.838849	89	1.949390
10	1.000000	30	1.477121	50	1.698970	70	1.845098	90	1.954243
11	1.041393	31	1.491362	51	1.707570	71	1.851258	91	1.959041
12	1.079181	32	1.505150	52	1.716003	72	1.857332	92	1.963788
13	1.113943	33	1.518514	53	1.724276	73	1.863323	93	1.968483
14	1.146128	34	1.531479	54	1.732394	74	1.869232	94	1.973128
15	1.176091	35	1.544068	55	1.740303	75	1.875061	95	1.977724
16	1.204120	36	1.556302	56	1.748188	76	1.880814	96	1.982271
17	1.230449	37	1.568202	57	1.755875	77	1.886491	97	1.986772
18	1.255273	38	1.579784	58	1.763428	78	1.892095	98	1.991226
19	1.278754	39	1.591065	59	1.770852	79	1.897627	99	1.995635
20	1.301030	40	1.602060	60	1.778151	80	1.903090	100	2.000000

TABLE XVIII.

LOGARITHMS OF NUMBERS.

No. 1000——1600 Log. 000000——204120

No.	0	1	2	3	4	5	6	7	8	9	Diff.
100	000000	000434	000868	001301	001734	002166	002598	003029	003460	003891	432
101	004321	004751	005180	005609	006038	006466	006894	007321	007748	008174	428
102	008600	009026	009451	009876	010300	010724	011147	011570	011993	012415	424
103	012837	013259	013680	014100	014520	014940	015360	015779	016197	016615	420
104	017033	017451	017868	018284	018700	019116	019532	019947	020361	020775	416
105	021189	021603	022016	022428	022841	023252	023664	024075	024486	024896	412
106	025306	025715	026124	026533	026942	027350	027757	028164	028571	028978	408
107	029384	029789	030195	030600	031004	031408	031812	032216	032619	033021	404
108	033424	033826	034227	034628	035029	035430	035830	036229	036629	037028	400
109	037426	037825	038223	038620	039017	039414	039811	040207	040602	040998	397
110	041393	041787	042182	042575	042969	043362	043755	044148	044540	044931	393
111	045323	045714	046105	046495	046885	047275	047664	048053	048442	048830	390
112	049218	049606	049993	050380	050766	051152	051538	051924	052309	052694	386
113	053078	053463	053846	054230	054613	054996	055378	055760	056142	056524	383
114	056905	057286	057666	058046	058426	058805	059185	059563	059942	060320	379
115	060698	061075	061452	061829	062206	062582	062958	063333	063709	064083	376
116	064458	064832	065206	065580	065953	066326	066699	067071	067443	067814	373
117	068186	068557	068928	069298	069668	070038	070407	070776	071145	071514	370
118	071882	072250	072617	072985	073352	073718	074085	074451	074816	075182	366
119	075547	075912	076276	076640	077004	077368	077731	078094	078457	078819	363
120	079181	079543	079904	080266	080026	080987	081347	081707	082067	082426	360
121	082785	083144	083503	083861	084219	084576	084934	085291	085647	086004	357
122	086360	086716	087071	087426	087781	088136	088490	088845	089198	089552	355
123	089905	090258	090611	090963	091315	091667	092018	092370	092721	093071	352
124	093422	093772	094122	094471	094820	095169	095518	095866	096215	096562	349
125	096910	097257	097604	097951	098297	098644	098990	099335	099681	100026	346
126	100370	100715	101059	101403	101747	102090	102434	102777	103119	103462	343
127	103804	104146	104487	104828	105169	105510	105851	106191	106531	106870	341
128	107210	107549	107888	108227	108565	108903	109241	109578	109916	110253	338
129	110590	110926	111262	111598	111934	112270	112605	112940	113275	113609	335
130	113943	114277	114611	114944	115278	115610	115943	116276	116608	116940	332
131	117271	117603	117934	118265	118595	118926	119256	119586	119915	120245	330
132	120574	120903	121231	121560	121888	122216	122543	122871	123198	123525	328
133	123852	124178	124504	124830	125156	125481	125806	126131	126456	126781	325
134	127105	127429	127752	128076	128399	128722	129045	129368	129690	130012	323
135	130334	130655	130977	131298	131619	131939	132260	132580	132900	133219	321
136	133539	133858	134177	134496	134814	135133	135451	135768	136086	136403	318
137	136721	137037	137354	137670	137987	138303	138618	138934	139249	139564	316
138	139879	140194	140508	140822	141136	141450	141763	142076	142389	142702	314
139	143015	143327	143639	143951	144263	144574	144885	145196	145507	145818	311
140	146128	146438	146748	147058	147367	147676	147985	148294	148603	148911	309
141	149219	149527	149835	150142	150449	150756	151063	151370	151676	151982	307
142	152288	152594	152900	153205	153510	153815	154119	154424	154728	155032	305
143	155336	155640	155943	156246	156549	156852	157154	157457	157759	158061	303
144	158362	158664	158965	159266	159567	159868	160168	160468	160769	161068	300
145	161368	161667	161967	162266	162564	162863	163161	163460	163757	164055	298
146	164353	164650	164947	165244	165541	165838	166134	166430	166726	167022	296
147	167317	167613	167908	168203	168497	168792	169086	169380	169674	169968	294
148	170262	170555	170848	171141	171434	171726	172019	172311	172603	172895	292
149	173186	173478	173769	174060	174351	174641	174932	175222	175512	175802	290
150	176091	176381	176670	176959	177248	177536	177825	178113	178401	178689	288
151	178977	179264	179552	179839	180126	180413	180699	180986	181272	181558	287
152	181844	182129	182415	182700	182985	183270	183554	183839	184123	184407	285
153	184691	184975	185259	185542	185825	186108	186391	186674	186956	187239	283
154	187521	187803	188084	188366	188647	188928	189209	189490	189771	190051	281
155	190332	190612	190892	191171	191451	191730	192010	192289	192567	192846	279
156	193125	193403	193681	193959	194237	194514	194792	195069	195346	195623	278
157	195900	196176	196452	196729	197005	197281	197556	197832	198107	198382	276
158	198657	198932	199206	199481	199755	200029	200303	200577	200850	201124	274
159	201397	201670	201943	202216	202488	202761	203033	203305	203577	203848	272
	0	1	2	3	4	5	6	7	8	9	

TABLE XVIII.

LOGARITHMS OF NUMBERS.

No. 1600 —— 2200 Log. 204120 —— 342423

No.	0	1	2	3	4	5	6	7	8	9	Diff.
160	204120	204391	204662	204933	205204	205475	205745	206016	206286	206556	271
161	206826	207095	207365	207634	207903	208172	208441	208710	208978	209247	269
162	209515	209783	210051	210318	210586	210853	211120	211388	211654	211921	267
163	212188	212454	212720	212986	213252	213518	213783	214049	214314	214579	266
164	214844	215109	215373	215638	215902	216166	216430	216694	216957	217221	264
165	217484	217747	218010	218273	218535	218798	219060	219322	219584	219846	202
166	220108	220370	220631	220892	221153	221414	221675	221936	222196	222456	261
167	222716	222976	223236	223496	223755	224015	224274	224533	224792	225051	259
168	225309	225568	225826	226084	226342	226600	226858	227115	227372	227630	258
169	227887	228144	228400	228657	228913	229170	229426	229682	229938	230193	256
170	230449	230704	230960	231215	231470	231724	231979	232233	232488	232742	255
171	232996	233250	233504	233757	234011	234264	234517	234770	235023	235276	253
172	235528	235781	236033	236285	236537	236789	237041	237292	237544	237795	252
173	238046	238297	238548	238799	239049	239299	239550	239800	240050	240300	250
174	240549	240799	241048	241297	241546	241795	242044	242293	242541	242790	249
175	243038	243286	243534	243782	244030	244277	244524	244772	245019	245266	247
176	245513	245759	246006	246252	246499	246745	246991	247236	247482	247728	246
177	247973	248219	248464	248709	248954	249198	249443	249687	249932	250176	245
178	250420	250664	250908	251151	251395	251638	251881	252125	252367	252610	243
179	252853	253096	253338	253580	253822	254064	254306	254548	254790	255031	242
180	255273	255514	255755	255996	256236	256477	256718	256958	257198	257439	241
181	257679	257918	258158	258398	258637	258877	259116	259355	259594	259833	239
182	260071	260310	260548	260787	261025	261263	261501	261738	261976	262214	238
183	262451	262688	262925	263162	263399	263636	263873	264109	264345	264582	237
184	264818	265054	265290	265525	265761	265996	266232	266467	266702	266937	235
185	267172	267406	267641	267875	268110	268344	268578	268812	269046	269279	234
186	269513	269746	269980	270213	270446	270679	270912	271144	271377	271609	233
187	271842	272074	272306	272538	272770	273001	273233	273464	273696	273927	232
188	274158	274389	274620	274850	275081	275311	275542	275772	276002	276232	230
189	276462	276691	276921	277151	277380	277609	277838	278067	278296	278525	229
190	278754	278982	279210	279439	279667	279895	280123	280351	280578	280806	228
191	281033	281261	281488	281715	281942	282169	282395	282622	282849	283075	227
192	283301	283527	283753	283979	284205	284431	284656	284882	285107	285332	226
193	285557	285782	286007	286232	286456	286681	286905	287130	287354	287578	225
194	287802	288025	288249	288473	288696	288920	289143	289366	289589	289812	223
195	290035	290257	290480	290702	290925	291147	291369	291591	291813	292034	222
196	292256	292478	292699	292920	293141	293363	293583	293804	294025	294246	221
197	294466	294687	294907	295127	295347	295567	295787	296007	296226	296446	220
198	296665	296884	297104	297323	297542	297761	297979	298198	298416	298635	219
199	298853	299071	299289	299507	299725	299943	300161	300378	300595	300813	218
200	301030	301247	301464	301681	301898	302114	302331	302547	302764	302980	217
201	303196	303412	303628	303844	304059	304275	304491	304706	304921	305136	216
202	305351	305566	305781	305996	306211	306425	306639	306854	307068	307282	214
203	307496	307710	307924	308137	308351	308564	308778	308991	309204	309417	213
204	309630	309843	310056	310268	310481	310693	310906	311118	311330	311542	212
205	311754	311966	312177	312389	312600	312812	313023	313234	313445	313656	211
206	313867	314078	314289	314499	314710	314920	315130	315340	315550	315760	210
207	315970	316180	316390	316599	316809	317018	317227	317436	317645	317854	209
208	318063	318272	318481	318689	318898	319106	319314	319522	319730	319938	208
209	320146	320354	320562	320769	320977	321184	321391	321598	321805	322012	207
210	322219	322426	322633	322839	323046	323252	323458	323665	323871	324077	206
211	324282	324488	324694	324899	325105	325310	325516	325721	325926	326131	205
212	326336	326541	326745	326950	327155	327359	327563	327767	327972	328176	204
213	328380	328583	328787	328991	329194	329398	329601	329805	330008	330211	203
214	330414	330617	330819	331022	331225	331427	331630	331832	332034	332236	202
215	332438	332640	332842	333044	333246	333447	333649	333850	334051	334253	202
216	334454	334655	334856	335056	335257	335458	335658	335859	336059	336260	201
217	336460	336660	336860	337060	337260	337459	337659	337858	338058	338257	200
218	338456	338656	338855	339054	339253	339451	339650	339849	340047	340246	199
219	340444	340642	340841	341039	341237	341435	341632	341830	342028	342225	198
	0	1	2	3	4	5	6	7	8	9	

TABLE XVIII.

LOGARITHMS OF NUMBERS.

No. 2200 ····· 2800 Log. 342423——447158

No.	0	1	2	3	4	5	6	7	8	9	Diff.
220	342423	342620	342817	343014	343212	343409	343606	343802	343999	344196	197
221	344392	344589	344785	344981	345178	345374	345570	345766	345962	346157	196
222	346353	346549	346744	346939	347135	347330	347525	347720	347915	348110	195
223	348305	348500	348694	348889	349083	349278	349472	349666	349860	350054	194
224	350248	350442	350636	350829	351023	351216	351410	351603	351796	351989	193
225	352182	352375	352568	352761	352954	353147	353339	353532	353724	353916	193
226	354108	354301	354493	354685	354876	355068	355260	355452	355643	355834	192
227	356026	356217	356408	356599	356790	356981	357172	357363	357554	357744	191
228	357935	358125	358316	358506	358696	358886	359076	359266	359456	359646	190
229	359835	360025	360215	360404	360593	360783	360972	361161	361350	361539	189
230	361728	361917	362105	362294	362482	362671	362859	363048	363236	363424	188
231	363612	363800	363988	364176	364363	364551	364739	364926	365113	365301	188
232	365488	365675	365862	366049	366236	366423	366610	366796	366983	367169	187
233	367356	367542	367129	367915	368101	368287	368473	368659	368844	369030	186
234	369216	369401	369587	369772	369958	370143	370328	370513	370698	370883	185
235	371068	371253	371437	371622	371806	371991	372175	372360	372544	372728	184
236	372912	373096	373280	373464	373647	373831	374015	374198	374382	374565	184
237	374748	374932	375115	375298	375481	375664	376846	372029	376212	376394	183
238	376577	376759	376942	377124	377306	377488	377670	377852	378034	378216	182
239	378398	378580	378761	378943	379124	379306	379487	379668	379849	380030	181
240	380211	380392	380573	380754	380934	381115	381296	381476	381656	381837	181
241	382017	382197	382377	382557	382737	382917	383097	383277	383456	383636	180
242	383815	383995	384174	384353	384533	384712	384891	385070	385249	385428	179
243	385606	385785	385963	386142	386321	386499	386677	386856	387034	387212	178
244	387390	387568	387746	387923	388101	388279	388456	388634	388811	388989	178
245	389166	389343	389520	389697	389875	390051	390228	390405	390582	390759	177
246	390935	391112	391288	391464	391641	391817	391993	392169	392345	392521	176
247	392697	392873	393048	393224	393400	393575	393751	393926	394101	394277	176
248	394452	394627	394802	394977	395152	395326	395501	395676	395850	396025	175
249	396199	396374	396548	396722	396896	397071	397245	397418	397592	397766	174
250	397940	398114	398287	398461	398634	398808	398981	399154	399327	399501	173
251	399674	399847	400020	400192	400365	400538	400711	400883	401056	401228	173
252	401400	401573	401745	401917	402089	402261	402433	402605	402777	402949	172
253	403120	403292	403464	403635	403807	403978	404149	404320	404492	404663	171
254	404834	405005	405175	405346	405517	405688	405858	406029	406199	406370	171
255	406540	406710	406881	407051	407221	407391	407561	407731	407900	408070	170
256	408240	408410	408579	408749	408918	409087	409257	409426	409595	409764	169
257	409933	410102	410271	410440	410608	410777	410946	411114	411283	411451	169
258	411620	411788	411956	412124	412292	412460	412628	412796	412964	413132	168
259	413300	413467	413635	413802	413970	414137	414305	414472	414639	414806	167
260	414973	415140	415307	415474	415641	415808	415974	416141	416308	416474	167
261	416640	416807	416973	417139	417306	417472	417638	417804	417970	418135	166
262	418301	418467	418633	418798	418964	419129	419295	419460	419625	419791	165
263	419956	420121	420286	420451	420616	420781	420945	421110	421275	421439	165
264	421604	421768	421933	422097	422261	422426	422590	422754	422918	423082	164
265	423246	423410	423573	423737	423901	424064	424228	424392	424555	424718	164
266	424882	425045	425208	425371	425534	425697	425860	426023	426186	426349	163
267	426511	426674	426836	426999	427161	427324	427486	427648	427811	427973	162
268	428135	428297	428459	428621	428782	428944	429106	429268	429429	429591	162
269	429752	429914	430075	430236	430398	430559	430720	430881	431042	431203	161
270	431364	431525	431685	431846	432007	432167	432328	432488	432649	432809	160
271	432969	433129	433290	433450	433610	433770	433930	434090	434249	434409	160
272	434569	434728	434888	435048	435207	435366	435526	435685	435844	436003	159
273	436163	436322	436481	436640	436798	436957	437116	437275	437433	437592	159
274	437751	437909	438067	438226	438384	438542	438700	438859	439017	439175	158
275	439333	439491	439648	439806	439964	440122	440279	440437	440594	440752	158
276	440909	441066	441224	441381	441538	441695	441852	442009	442166	442323	157
277	442480	442636	442793	442950	443106	443263	443419	443576	443732	443888	157
278	444045	444201	444357	444513	444669	444825	444981	445137	445293	445448	156
279	445604	445760	445915	446071	446226	446382	446537	446692	446848	447003	155
	0	1	2	3	4	5	6	7	8	9	

TABLE XVIII.

LOGARITHMS OF NUMBERS.

No. 2800.——3400 Log. 447158——531479

No.	0	1	2	3	4	5	6	7	8	9	Diff.
280	447158	447313	447468	447623	447778	447933	448088	448242	448397	448552	155
281	448706	448861	449015	449170	449324	449478	449633	449787	449941	450095	154
282	450249	450403	450557	450711	450865	451018	451172	451326	451479	451633	154
283	451786	451940	452093	452247	452400	452553	452706	452859	453012	453165	153
284	453318	453471	453624	453777	453930	454082	454235	454387	454540	454692	153
285	454845	454997	455149	455302	455454	455606	455758	455910	456062	456214	152
286	456366	456518	456670	456821	456973	457125	457276	457428	457579	457730	152
287	457882	458033	458184	458336	458487	458638	458789	458940	459091	459242	151
288	459392	459543	459694	459845	459995	460146	460296	460447	460597	460747	151
289	460898	461048	461198	461348	461498	461649	461799	461948	462098	462248	150
290	462398	462548	462697	462847	462997	463146	463296	463445	463594	463744	150
291	463893	464042	464191	464340	464489	464639	464787	464936	465085	465234	149
292	465383	465532	465680	465829	465977	466126	466274	466423	466571	466719	149
293	466868	467016	467164	467312	467460	467608	467756	467904	468052	468200	148
294	468347	468495	468643	468790	468938	469085	469233	469380	469527	469675	148
295	469822	469969	470116	470263	470410	470557	470704	470851	470998	471145	147
296	471292	471438	471585	471732	471878	472025	472171	472317	472464	472610	147
297	472756	472903	473049	473195	473341	473487	473633	473779	473925	474070	146
298	474216	474362	474508	474653	474799	474944	475090	475235	475381	475526	146
299	475671	475816	475962	476107	476252	476397	476542	476687	476832	476976	145
300	477121	477266	477411	477555	477700	477844	477989	478133	478278	478422	145
301	478566	478711	478855	478999	479143	479287	479431	479575	479719	479863	144
302	480007	480151	480294	480438	480582	480725	480869	481012	481156	481299	144
303	481443	481586	481729	481872	482016	482159	482302	482445	482588	482731	143
304	482874	483016	483159	483302	483445	483587	483730	483872	484015	484157	143
305	484300	484442	484584	484727	484869	485011	485153	485295	485437	485579	142
306	485721	485863	486005	486147	486289	486430	486572	486714	486855	486997	142
307	487138	487280	487421	487563	487704	487845	487986	488127	488269	488410	141
308	488551	488692	488833	488973	489114	489255	489396	489537	489677	489818	141
309	489958	490099	490239	490380	490520	490661	490801	490941	491081	491222	140
310	491362	491502	491642	491782	491922	492062	492201	492341	492481	492621	140
311	492760	492900	493040	493179	493319	493458	493597	493737	493876	494015	139
312	494155	494294	494433	494572	494711	494850	494989	495128	495267	495406	139
313	495544	495683	495822	495960	496099	496237	496376	496514	496653	496791	139
314	496930	497068	497206	497344	497482	497621	497759	497897	498035	498173	138
315	498311	498448	498586	498724	498862	498999	499137	499275	499412	499550	138
316	499687	499824	499962	500099	500236	500374	500511	500648	500785	500922	137
317	501059	501196	501333	501470	501607	501744	501880	502017	502154	502290	137
318	502427	502564	502700	502837	502973	503109	503246	503382	503518	503654	136
319	503791	503927	504063	504199	504335	504471	504607	504743	504878	505014	136
320	505150	505286	505421	505557	505692	505828	505963	506099	506234	506370	136
321	506505	506640	506775	506911	507046	507181	507316	507451	507586	507721	135
322	507856	507991	508125	508260	508395	508530	508664	508799	508933	509068	135
323	509202	509337	509471	509606	509740	509874	510008	510143	510277	510411	134
324	510545	510679	510813	510947	511081	511215	511348	511482	511616	511750	134
325	511883	512017	512150	512284	512417	512551	512684	512818	512951	513084	133
326	513218	513351	513484	513617	513750	513883	514016	514149	514282	514415	133
327	514548	514680	514813	514946	515079	515211	515344	515476	515609	515741	133
328	515874	516006	516139	516271	516403	516535	516668	516800	516932	517064	132
329	517196	517328	517460	517792	517724	517855	517987	518119	518251	518382	132
330	518514	518645	518777	518909	519040	519171	519303	519434	519565	519697	131
331	519828	519959	520090	520221	520352	520483	520614	520745	520876	521007	131
332	521138	521269	521400	521530	521661	521792	521922	522053	522183	522314	131
333	522444	522575	522705	522835	522966	523096	523226	523356	523486	523616	130
334	523746	523876	524006	524136	524266	524396	524526	524656	524785	524915	130
335	525045	525174	525304	525434	525563	525693	525822	525951	526081	526210	129
336	526339	526468	526598	526727	526856	526985	527114	527243	527372	527501	129
337	527630	527759	527888	528016	528145	528274	528402	528531	528660	528788	129
338	528917	529045	529174	529302	529430	529559	529687	529815	529943	530072	128
339	530200	530328	530456	530584	530712	530840	530968	531095	531223	531351	128
	0	1	2	3	4	5	6	7	8	9	

TABLE XVIII.

LOGARITHMS OF NUMBERS.

No. 3400 ——4000 Log. 531479 ——602060

No.	0	1	2	3	4	5	6	7	8	9	Diff.
340	531479	531607	531734	531862	531990	532117	532245	532372	532500	532627	128
341	532754	532882	533009	533136	533263	533391	533518	533645	533772	533899	127
342	534026	534153	534280	534407	534534	534661	534787	534914	535041	535167	127
343	535294	535421	535547	535674	535800	535927	536053	536179	536306	536432	126
344	536558	536685	536811	536937	537063	537189	537315	537441	537567	537693	126
345	537819	537945	538071	538197	538322	538448	538574	538699	538825	538951	126
346	539076	539202	539327	539452	539578	539703	539829	539954	540079	540204	125
347	540329	540455	540580	540705	540830	540955	541080	541205	541330	541454	125
348	541579	541704	541829	541953	542078	542203	542327	542452	542576	542701	125
349	542825	542950	543074	543199	543323	543447	543571	543696	543820	543944	124
350	544068	544192	544316	544440	544564	544688	544812	544936	545060	545183	124
351	545307	545431	545554	545678	545802	545925	546049	546172	546296	546419	124
352	546543	546666	546789	546913	547036	547159	547282	547405	547529	547652	123
353	547775	547898	548021	548144	548266	548389	548512	548635	548758	548881	123
354	549003	549126	549249	549371	549494	549616	549739	549861	549984	550106	123
355	550228	550351	550473	550595	550717	550840	550962	551084	551206	551328	122
356	551450	551572	551694	551816	551938	552059	552181	552303	552125	552546	122
357	552668	552790	552911	553033	553154	553276	553398	553519	553640	553762	121
358	553883	554004	554126	554247	554368	554489	554610	554731	554852	554973	121
359	555094	555215	555336	555457	555578	555699	555820	555940	556001	556182	121
360	556302	556423	556544	556664	556785	556905	557026	557146	557267	557387	120
361	557507	557627	557748	557868	557988	558108	558228	558348	558469	558589	120
362	558709	558829	558948	559068	559188	559308	559428	559548	559667	559787	120
363	559907	560026	560146	560265	560385	560504	560624	560743	560863	560982	119
364	561101	561221	561340	561459	561578	561698	561817	561936	562055	562174	119
365	562293	562412	562531	562650	562769	562887	563006	563125	563244	563362	119
366	563481	563600	563718	563837	563955	564074	564192	564311	564429	564548	119
367	564666	564784	564903	565021	565139	565257	565376	565494	565612	565730	118
368	565848	565966	566084	566202	566320	566437	566555	566673	566791	566909	118
369	567026	567144	567262	567379	567497	567614	567732	567849	567967	568084	118
370	568202	568319	568436	568554	568671	568788	568905	569023	569140	569257	117
371	569374	569491	569608	569725	569842	569959	570076	570193	570309	570426	117
372	570543	570660	570776	570893	571010	571126	571243	571359	571476	571592	117
373	571709	571825	571942	572058	572174	572291	572407	572523	572639	572755	116
374	572872	572988	573104	573220	573336	573452	573568	573684	573800	573915	116
375	574031	574147	574263	574379	574494	574610	574726	574841	574957	575072	116
376	575188	575303	575419	575534	575650	575765	575880	575996	576111	576226	115
377	576341	576457	576572	576687	576802	576917	577032	577147	577262	577377	115
378	577492	577607	577721	577836	577951	578066	578181	578295	578410	578525	115
379	578639	578754	578868	578983	579097	579212	579326	579441	579555	579669	114
380	579784	579898	580012	580126	580240	580355	580469	580583	580697	580811	114
381	580925	581039	581153	581267	581381	581495	581608	581722	581836	581950	114
382	582063	582177	582291	582404	582518	582631	582745	582858	582972	583085	114
383	583199	583312	583426	583539	583652	583765	583879	583992	584105	584218	113
384	584331	584444	584557	584670	584783	584896	585009	585122	585235	585348	113
385	585461	585574	585686	585799	585912	586024	586137	586250	586362	586475	113
386	586587	586700	586812	586925	587037	587149	587262	587374	587486	587599	112
387	587711	587823	587935	588047	588160	588272	588384	588496	588608	588720	112
388	588832	588944	589056	589167	589279	589391	589503	589615	589726	589838	112
389	589950	590061	590173	590284	590396	590507	590619	590730	590842	590953	112
390	591065	591176	591287	591399	591510	591621	591732	591843	591955	592066	111
391	592177	592288	592399	592510	592621	592732	592843	592954	593064	593175	111
392	593286	593397	593508	593618	593729	593840	593950	594061	594171	594282	111
393	594393	594503	594613	594724	594834	594945	595055	595165	595276	595386	110
394	595496	595606	595717	595827	595937	596047	596157	596267	596377	596487	110
395	596597	596707	596817	596927	597037	597146	597256	597366	597476	597585	110
396	597695	597805	597914	598024	598134	598243	598353	598462	598572	598681	110
397	598790	598900	599009	599119	599228	599337	599446	599556	599665	599774	109
398	599883	599992	600101	600210	600319	600428	600537	600646	600755	600864	109
399	600973	601082	601190	601299	601408	601517	601625	601734	601843	601951	109
	0	1	2	3	4	5	6	7	8	9	

TABLE XVI.

To reduce the SUN'S RIGHT ASCENSION to any given Meridian, and to any Time under that Meridian.

{ Add in W. long. }
{ Sub. in E. long. }

{ Add aft. noon. }
{ Sub. bef. noon }

Long.	SUN'S RIGHT ASCENSION.												Time fr. Noon.
	0h.	1h.	2h.	3h.	4h.	5h.	6h.	7h.	8h.	9h.	10h.	11h.	
°	m. s	m. s	m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	m s.	h. m.
0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
3	0 2	0 2	0 2	0 2	0 2	0 2	0 2	0 2	0 2	0 2	0 2	0 2	0 12
6	0 4	0 4	0 4	0 4	0 4	0 4	0 4	0 4	0 4	0 4	0 4	0 4	0 24
9	0 6	0 6	0 6	0 6	0 6	0 6	0 6	0 6	0 6	0 6	0 6	0 5	0 36
12	0 7	0 7	0 7	0 8	0 8	0 8	0 8	0 8	0 8	0 8	0 7	0 7	0 48
15	0 9	0 9	0 9	0 10	0 10	0 10	0 10	0 10	0 10	0 10	0 9	0 9	1 0
18	0 11	0 11	0 11	0 12	0 12	0 12	0 12	0 12	0 12	0 11	0 11	0 11	1 12
21	0 13	0 13	0 13	0 14	0 14	0 14	9 14	0 14	0 14	0 13	0 13	0 13	1 24
24	0 15	0 15	0 15	0 15	0 16	0 16	0 17	0 16	0 16	0 15	0 15	0 14	1 36
27	0 16	0 16	0 17	0 17	0 18	0 18	0 19	0 18	0 18	0 17	0 17	0 16	1 48
30	0 18	0 18	0 19	0 19	0 20	0 21	0 21	0 21	0 20	0 19	0 18	0 18	2 0
33	0 20	0 20	0 21	0 21	0 22	0 23	0 23	0 23	0 22	0 21	0 20	0 20	2 12
36	0 22	0 22	0 22	0 23	0 24	0 25	0 25	0 25	0 24	0 23	0 22	0 22	2 24
39	0 24	0 24	0 24	0 25	0 26	0 27	0 27	0 27	0 26	0 25	0 24	0 23	2 36
42	0 25	0 25	0 26	0 27	0 28	0 29	0 29	0 29	0 28	0 27	0 26	0 25	2 48
45	0 27	0 27	0 28	0 29	0 30	0 31	0 31	0 31	0 30	0 29	0 28	0 27	3 0
48	0 29	0 29	0 30	0 31	0 32	0 33	0 33	0 33	0 32	0 31	0 30	0 29	3 12
51	0 31	0 31	0 32	0 33	0 34	0 35	0 35	0 35	0 34	0 33	0 32	0 31	3 24
54	0 33	0 33	0 34	0 35	0 36	0 37	0 37	0 37	0 36	0 35	0 33	0 32	3 36
57	0 35	0 35	0 36	0 37	0 38	0 39	0 39	0 39	0 38	0 36	0 35	0 34	3 48
60	0 36	0 36	0 37	0 39	0 40	0 41	0 42	0 41	0 40	0 38	0 37	0 36	4 0
63	0 38	0 38	0 39	0 41	0 42	0 43	0 44	0 43	0 42	0 40	0 39	0 38	4 12
66	0 40	0 40	0 41	0 43	0 44	0 45	0 46	0 45	0 44	0 42	0 41	0 40	4 24
69	0 42	0 42	0 43	0 45	0 46	0 47	0 48	0 47	0 46	0 44	0 42	0 41	4 36
72	0 44	0 44	0 45	0 46	0 48	0 49	0 50	0 49	0 48	0 46	0 44	0 43	4 48
75	0 45	0 46	0 47	0 48	0 50	0 51	0 52	0 51	0 50	0 48	0 46	0 45	5 0
78	0 47	0 47	0 49	0 50	0 52	0 54	0 54	0 53	0 52	0 50	0 48	0 47	5 12
81	0 49	0 49	0 50	0 52	0 54	0 56	0 56	0 55	0 54	0 52	0 50	0 49	5 24
84	0 51	0 51	0 52	0 54	0 56	0 58	0 58	0 58	0 56	0 54	0 52	0 50	5 36
87	0 53	0 53	0 54	0 56	0 58	1 0	1 0	1 0	0 58	0 56	0 54	0 52	5 48
90	0 54	0 55	0 56	0 58	1 0	1 2	1 2	1 2	1 0	0 58	0 55	0 54	6 0
93	0 56	0 56	0 58	1 0	1 2	1 4	1 4	1 4	1 2	1 0	0 57	0 56	6 12
96	0 58	0 58	1 0	1 2	1 4	1 6	1 6	1 6	1 4	1 2	0 59	0 58	6 24
99	1 0	1 0	1 2	1 4	1 6	1 8	1 9	1 8	1 6	1 3	1 1	0 59	6 36
102	1 2	1 2	1 3	1 6	1 8	1 10	1 11	1 10	1 8	1 5	1 3	1 1	6 48
105	1 4	1 4	1 5	1 8	1 10	1 12	1 13	1 12	1 10	1 7	1 5	1 3	7 0
108	1 5	1 6	1 7	1 10	1 12	1 14	1 15	1 14	1 12	1 9	1 7	1 5	7 12
111	1 7	1 7	1 9	1 12	1 14	1 16	1 17	1 16	1 14	1 11	1 8	1 7	7 24
114	1 9	1 9	1 11	1 14	1 16	1 18	1 19	1 18	1 16	1 13	1 10	1 9	7 36
117	1 11	1 11	1 13	1 16	1 18	1 20	1 21	1 20	1 18	1 15	1 12	1 10	7 48
120	1 13	1 13	1 15	1 17	1 20	1 22	1 23	1 22	1 20	1 17	1 14	1 12	8 0
123	1 14	1 15	1 17	1 19	1 22	1 25	1 25	1 24	1 22	1 19	1 16	1 14	8 12
126	1 16	1 16	1 18	1 21	1 24	1 27	1 27	1 26	1 24	1 21	1 18	1 16	8 24
129	1 18	1 18	1 20	1 23	1 26	1 29	1 29	1 28	1 26	1 23	1 19	1 18	8 36
132	1 20	1 20	1 22	1 25	1 28	1 31	1 31	1 30	1 28	1 25	1 21	1 19	8 48
135	1 22	1 22	1 24	1 27	1 30	1 33	1 34	1 32	1 30	1 26	1 23	1 21	9 0
138	1 24	1 24	1 26	1 29	1 32	1 35	1 36	1 35	1 32	1 28	1 25	1 23	9 12
141	1 26	1 26	1 28	1 31	1 34	1 37	1 38	1 37	1 34	1 30	1 27	1 25	9 24
144	1 27	1 27	1 30	1 33	1 36	1 39	1 40	1 39	1 36	1 32	1 29	1 27	9 36
147	1 29	1 29	1 32	1 35	1 38	1 41	1 42	1 41	1 38	1 34	1 31	1 28	9 48
150	1 31	1 31	1 33	1 37	1 40	1 43	1 44	1 43	1 40	1 36	1 32	1 30	10 0
153	1 33	1 33	1 35	1 39	1 42	1 45	1 46	1 45	1 42	1 38	1 34	1 32	10 12
156	1 34	1 35	1 37	1 41	1 44	1 47	1 48	1 47	1 44	1 40	1 36	1 34	10 24
159	1 36	1 37	1 39	1 43	1 46	1 49	1 50	1 49	1 46	1 42	1 38	1 36	10 36
162	1 38	1 38	1 41	1 45	1 48	1 51	1 52	1 51	1 48	1 44	1 40	1 37	10 48
165	1 40	1 40	1 43	1 46	1 50	1 53	1 54	1 53	1 50	1 46	1 42	1 39	11 0
168	1 42	1 42	1 45	1 48	1 52	1 55	1 56	1 55	1 52	1 48	1 44	1 41	11 12
171	1 44	1 44	1 46	1 50	1 54	1 57	1 59	1 57	1 54	1 49	1 45	1 43	11 24
174	1 45	1 46	1 48	1 52	1 57	2 0	2 1	1 59	1 56	1 51	1 47	1 45	11 36
177	1 47	1 48	1 50	1 54	1 59	2 2	2 3	2 1	1 58	1 53	1 49	1 46	11 48
180	1 49	1 49	1 52	1 56	2 1	2 4	2 5	2 3	2 0	1 55	1 51	1 48	12 0

TABLE XVI.

To reduce the SUN'S RIGHT ASCENSION to any given Meridian, and to any
{ Add in W. long. / Sub. in E. long. } Time under that Meridian. { Add aft. noon. / Sub. bef. noon. }

Long.	SUN'S RIGHT ASCENSION.												Time fr. Noon.
	12h.	13h.	14h.	15h.	16h.	17h.	18h.	19h.	20h.	21h.	22h.	23h.	
°	m. s.	m. s	m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	m. s	m. s.	m. s.	h. m.
0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
3	0 2	0 2	0 2	0 2	0 2	0 2	0 2	0 2	0 2	0 2	0 2	0 2	0 12
6	0 4	0 4	0 4	0 4	0 4	0 4	0 5	0 4	0 4	0 4	0 4	0 4	0 24
9	0 5	0 5	0 6	0 6	0 6	0 7	0 7	0 7	0 6	0 6	0 6	0 6	0 36
12	0 7	0 7	0 8	0 8	0 8	0 9	0 9	0 9	0 8	0 8	0 8	0 7	0 48
15	0 9	0 9	0 10	0 10	0 11	0 11	0 11	0 11	0 11	0 10	0 10	0 9	1 0
18	0 11	0 11	0 11	0 12	0 13	0 13	0 13	0 13	0 13	0 12	0 12	0 11	1 12
21	0 13	0 13	0 13	0 14	0 15	0 15	0 16	0 15	0 15	0 14	0 14	0 13	1 24
24	0 14	0 15	0 15	0 16	0 17	0 17	0 18	0 18	0 17	0 16	0 15	0 15	1 36
27	0 16	0 17	0 17	0 18	0 19	0 20	0 20	0 20	0 19	0 18	0 17	0 17	1 48
30	0 18	0 18	0 19	0 20	0 21	0 22	0 22	0 22	0 21	0 20	0 19	0 19	2 0
33	0 20	0 20	0 21	0 22	0 23	0 24	0 24	0 21	0 23	0 22	0 21	0 21	2 12
36	0 22	0 22	0 23	0 24	0 25	0 26	0 27	0 26	0 26	0 24	0 23	0 23	2 24
39	0 23	0 24	0 25	0 26	0 27	0 28	0 29	0 29	0 28	0 26	0 25	0 24	2 36
42	0 25	0 26	0 27	0 28	0 30	0 31	0 31	0 31	0 30	0 28	0 27	0 26	2 48
45	0 27	0 28	0 29	0 30	0 32	0 33	0 33	0 33	0 32	0 30	0 29	0 28	3 0
48	0 29	0 29	0 31	0 32	0 34	0 35	0 35	0 35	0 34	0 32	0 31	0 30	3 12
51	0 31	0 31	0 33	0 34	0 36	0 37	0 38	0 37	0 36	0 35	0 33	0 32	3 24
54	0 32	0 33	0 34	0 36	0 38	0 39	0 40	0 49	0 38	0 37	0 35	0 34	3 36
57	0 34	0 34	0 36	0 38	0 40	0 42	0 42	0 42	0 40	0 39	0 37	0 36	3 48
60	0 36	0 37	0 38	0 40	0 42	0 44	0 44	0 44	0 43	0 41	0 39	0 37	4 0
63	0 38	0 39	0 40	0 42	0 41	0 46	0 47	0 46	0 45	0 43	0 41	0 39	4 12
66	0 40	0 40	0 42	0 44	0 47	0 48	0 49	0 48	0 47	0 45	0 43	0 41	4 24
69	0 41	0 42	0 44	0 46	0 49	0 50	0 51	0 51	0 49	0 47	0 44	0 43	4 36
72	0 43	0 44	0 46	0 48	0 51	0 53	0 53	0 53	0 51	0 49	0 46	0 45	4 48
75	0 45	0 46	0 48	0 50	0 53	0 55	0 56	0 55	0 53	0 51	0 48	0 47	5 0
78	0 47	0 48	0 50	0 52	0 55	0 57	0 58	0 57	0 55	0 53	0 50	0 49	5 12
81	0 49	0 50	0 52	0 54	0 57	0 59	1 0	0 59	0 58	0 55	0 52	0 51	5 24
84	0 50	0 51	0 54	0 56	0 59	1 1	1 2	1 2	1 0	0 57	0 54	0 52	5 36
87	0 52	0 53	0 56	0 59	1 1	1 4	1 4	1 4	1 2	0 59	0 56	0 54	5 48
90	0 54	0 55	0 58	1 1	1 4	1 6	1 7	1 6	1 4	1 1	0 58	0 56	6 0
93	0 56	0 57	0 59	1 3	1 6	1 8	1 9	1 8	1 6	1 3	1 0	0 58	6 12
96	0 58	0 59	1 1	1 5	1 8	1 10	1 11	1 10	1 8	1 5	1 2	1 0	6 24
99	0 59	1 1	1 3	1 7	1 10	1 12	1 13	1 13	1 10	1 7	1 4	1 2	6 36
102	1 1	1 2	1 5	1 9	1 12	1 15	1 16	1 15	1 12	1 9	1 6	1 4	6 48
105	1 3	1 4	1 7	1 11	1 14	1 17	1 18	1 17	1 14	1 11	1 8	1 6	7 0
108	1 5	1 6	1 9	1 13	1 16	1 19	1 20	1 19	1 17	1 13	1 10	1 7	7 12
111	1 7	1 8	1 11	1 15	1 18	1 21	1 22	1 21	1 19	1 15	1 12	1 9	7 24
114	1 8	1 10	1 13	1 17	1 20	1 23	1 24	1 24	1 21	1 17	1 14	1 11	7 36
117	1 10	1 12	1 15	1 19	1 23	1 25	1 27	1 26	1 23	1 19	1 16	1 13	7 48
120	1 12	1 13	1 17	1 21	1 25	1 28	1 29	1 28	1 25	1 21	1 17	1 15	8 0
123	1 14	1 15	1 19	1 23	1 27	1 30	1 31	1 30	1 27	1 23	1 19	1 17	8 12
126	1 16	1 17	1 21	1 25	1 29	1 32	1 33	1 32	1 29	1 25	1 21	1 19	8 24
129	1 17	1 19	1 22	1 27	1 31	1 34	1 36	1 35	1 32	1 27	1 23	1 21	8 36
132	1 19	1 21	1 24	1 29	1 33	1 36	1 38	1 37	1 34	1 29	1 25	1 22	8 48
135	1 21	1 23	1 26	1 31	1 35	1 39	1 40	1 39	1 36	1 31	1 27	1 24	9 0
138	1 23	1 25	1 28	1 33	1 37	1 41	1 42	1 41	1 38	1 33	1 29	1 26	9 12
141	1 25	1 26	1 30	1 35	1 40	1 43	1 44	1 43	1 40	1 36	1 31	1 28	9 24
144	1 26	1 28	1 32	1 37	1 42	1 45	1 47	1 46	1 42	1 38	1 33	1 30	9 36
147	1 28	1 30	1 34	1 39	1 44	1 47	1 49	1 48	1 44	1 40	1 35	1 32	9 48
150	1 30	1 32	1 36	1 41	1 46	1 50	1 51	1 50	1 46	1 42	1 37	1 34	10 0
153	1 32	1 34	1 38	1 43	1 48	1 52	1 53	1 52	1 49	1 44	1 39	1 36	10 12
156	1 34	1 36	1 40	1 45	1 50	1 54	1 56	1 54	1 51	1 46	1 41	1 38	10 24
159	1 35	1 37	1 42	1 47	1 52	1 56	1 58	1 57	1 53	1 48	1 43	1 39	10 36
162	1 37	1 39	1 44	1 49	1 54	1 58	2 0	1 59	1 55	1 50	1 45	1 41	10 48
165	1 39	1 41	1 46	1 51	1 57	2 1	2 2	2 1	1 57	1 52	1 46	1 43	11 0
168	1 41	1 43	1 47	1 53	1 59	2 3	2 4	2 3	1 59	1 54	1 48	1 45	11 12
171	1 43	1 45	1 49	1 55	2 1	2 5	2 7	2 5	2 1	1 56	1 50	1 47	11 24
174	1 44	1 47	1 51	1 57	2 3	2 7	2 9	2 8	2 4	1 58	1 52	1 49	11 36
177	1 46	1 48	1 53	1 59	2 5	2 9	2 11	2 10	2 6	2 0	1 54	1 51	11 48
180	1 48	1 50	1 55	2 1	2 7	2 12	2 13	2 12	2 8	2 2	1 56	1 52	12 0

TABLE XVIII.

LOGARITHMS OF NUMBERS.

No. 5200. ——5800 Log. 716003 ——763428

No.	0	1	2	3	4	5	6	7	8	9	Diff.
520	716003	716087	716170	716254	716337	716421	716504	716588	716671	716754	83
521	716838	716921	717004	717088	717171	717254	717338	717421	717504	717587	83
522	717671	717754	717837	717920	718003	718086	718169	718253	718336	718419	83
523	718502	718585	718668	718751	718834	718917	719000	719083	719165	719248	83
524	719331	719414	719497	719580	719663	719745	719828	719911	719994	720077	83
525	720159	720242	720325	720407	720490	720573	720655	720738	720821	720903	83
526	720986	721068	721151	721233	721316	721398	721481	721563	721646	721728	82
527	721811	721893	721975	722058	722140	722222	722305	722387	722469	722552	82
528	722634	722716	722798	722881	722963	723045	723127	723209	723291	723374	82
529	723456	723538	723620	723702	723784	723866	723948	724030	724112	724194	82
530	724276	724358	724440	724522	724603	724685	724767	724849	724931	725013	82
531	725095	725176	725258	725340	725422	725503	725585	725667	725748	725830	82
532	725912	725993	726075	726156	726238	726320	726401	726483	726564	726646	82
533	726727	726809	726890	726972	727053	727134	727216	727297	727379	727460	81
534	727541	727623	727704	727785	727866	727948	728029	728110	728191	728273	81
535	728354	728435	728516	728597	728678	728759	728841	728922	729003	729084	81
536	729165	729246	729327	729408	729489	729570	729651	729732	729813	729893	81
537	729974	730055	730136	730217	730298	730378	730459	730540	730621	730702	81
538	730782	730863	730944	731024	731105	731186	731266	731347	731428	731508	81
539	731589	731669	731750	731830	731911	731991	732072	732152	732233	732313	81
540	732394	732474	732555	732635	732715	732796	732876	732956	733037	733117	80
541	733197	733278	733358	733438	733518	733598	733679	733759	733839	733919	80
542	733999	734079	734159	734240	734320	734400	734480	734560	734640	734720	80
543	734800	734880	734960	735040	735120	735200	735279	735359	735439	735519	80
544	735599	735679	735759	735838	735918	735998	736078	736157	736237	736317	80
545	736396	736476	736556	736635	736715	736795	736874	736954	737034	737113	80
546	737193	737272	737352	737431	737511	737590	737670	737749	737829	737908	79
547	737987	738067	738146	738225	738305	738384	738463	738543	738622	738701	79
548	738781	738860	738939	739018	739097	739177	739256	739335	739414	739493	79
549	739572	739651	739730	739810	739889	739968	740047	740126	740205	740284	79
550	740363	740442	740521	740599	740678	740757	740836	740915	740994	741073	79
551	741152	741230	741309	741388	741467	741546	741624	741703	741782	741860	79
552	741939	742018	742096	742175	742254	742332	742411	742489	742568	742647	79
553	742725	742804	742882	742961	743039	743118	743196	743275	743353	743431	78
554	743510	743588	743667	743745	743823	743902	743980	744058	744136	744215	78
555	744293	744371	744449	744528	744606	744684	744762	744840	744919	744997	78
556	745075	745153	745231	745309	745387	745465	745543	745621	745699	745777	78
557	745855	745933	746011	746089	746167	746245	746323	746401	746479	746556	78
558	746634	746712	746790	746868	746945	747023	747101	747179	747256	747334	78
559	747412	747489	747567	747645	747722	747800	747878	747955	748033	748110	78
560	748188	748266	748343	748421	748498	748576	748653	748731	748808	748885	77
561	748963	749040	749118	749195	749272	749350	749427	749504	749582	749659	77
562	749736	749814	749891	749968	750045	750123	750200	750277	750354	750431	77
563	750508	750586	750663	750740	750817	750894	750971	751048	751125	751202	77
564	751279	751356	751433	751510	751587	751664	751741	751818	751895	751972	77
565	752048	752125	752202	752279	752356	752433	752509	752586	752663	752740	77
566	752816	752893	752970	753047	753123	753200	753277	753353	753430	753506	77
567	753583	754660	753736	753813	753889	753966	754042	754119	754195	754272	77
568	754348	754425	754501	754578	754654	754730	754807	754883	754960	755036	76
569	755112	755189	755265	755341	755417	755494	755570	755646	755722	755799	76
570	755875	755951	756027	756103	756180	756256	756332	756408	756484	756560	76
571	756636	756712	756788	756864	756940	757016	757092	757168	757244	757320	76
572	757396	757472	757548	757624	757700	757775	757851	757927	758003	758079	76
573	758155	758230	758306	758382	758458	758533	758609	758685	758761	758836	76
574	758912	758988	759063	759139	759214	759290	759366	759441	759517	759592	76
575	759668	759743	759819	759894	759970	760045	760121	760196	760272	760347	75
576	760422	760498	760573	760649	760724	760799	760875	760950	761025	761101	75
577	761176	761251	761326	761402	761477	761552	761627	761702	761778	761853	75
578	761928	762003	762078	762153	762228	762303	762378	762453	762529	762604	75
579	762679	762754	762829	762904	762978	763053	763128	763203	763278	763353	75
	0	1	2	3	4	5	6	7	8	9	

TABLE XVIII.

LOGARITHMS OF NUMBERS.

No. 5800——6400 Log. 763428—— 806180

No.	0	1	2	3	4	5	6	7	8	9	Diff.
580	763428	763503	763578	763653	763727	763802	763877	763952	764027	764101	75
581	764176	76425	764326	764400	764475	764550	764624	764699	764774	764848	75
582	764923	764998	765072	765147	765221	765296	765370	765445	765520	765594	75
583	765669	765743	765818	765892	765966	766041	766115	766190	766264	766338	74
584	766413	766487	766562	766636	766710	766785	766859	766933	767007	767082	74
585	767156	767230	767304	767379	767453	767527	767601	767675	767749	767823	74
586	767898	767972	768046	768120	768194	768268	768342	768416	768490	768564	74
587	768638	768712	768786	768860	768934	769008	769082	769156	769230	769303	74
588	769377	769451	769525	769599	769673	769746	769820	769894	769968	770042	74
589	770115	770189	770263	770336	770410	770484	770557	770631	770705	770778	74
590	770852	770926	770999	771073	771146	771220	771293	771367	771440	771514	74
591	771587	771661	771734	771808	771881	771955	772028	772102	772175	772248	73
592	772322	772395	772468	772542	772615	772688	772762	772835	772908	772981	73
593	773055	773128	773201	773274	773348	773421	773494	773567	773640	773713	73
594	773786	773860	773933	774006	774079	774152	774225	774298	774371	774444	73
595	774517	774590	774663	774736	774809	774882	774955	775028	775100	775173	73
596	775246	775319	775392	775465	775538	775610	775683	775756	775829	775902	73
597	775974	776047	776120	776193	776265	776338	776411	776483	776556	776629	73
598	776701	776774	776846	776919	776992	777064	777137	777209	777282	777354	73
599	777427	777499	777572	777644	777717	777789	777862	777934	778006	778079	73
600	778151	778224	778296	778368	778441	778513	778585	778658	778730	778802	72
601	778874	778947	779019	779091	779163	779236	779308	779380	779452	779524	72
602	779596	779669	779741	779813	779885	779957	780029	780101	780173	780245	72
603	780317	780389	780461	780533	780605	780677	780749	780821	780893	780965	72
604	781037	781109	781181	781253	781324	781396	781468	781540	781612	781684	72
605	781755	781827	781899	781971	782042	782114	782186	782258	782329	782401	72
606	782473	782544	782616	782688	782759	782831	782902	782974	783046	783117	72
607	783189	783260	783332	783403	783475	783546	783618	783689	783761	783832	71
608	783904	783975	784046	784118	784189	784261	784332	784403	784475	784546	71
609	784617	784689	784760	784831	784902	784974	785045	785116	785187	785259	71
610	785330	785401	785472	785543	785615	785686	785757	785828	785899	785970	71
611	786041	786112	786183	786254	786325	786396	786467	786538	786609	786680	71
612	786751	786822	786893	786964	787035	787106	787177	787248	787319	787390	71
613	787460	787531	787602	787673	787744	787815	787885	787956	788027	788098	71
614	788168	788239	788310	788381	788451	788522	788593	788663	788734	788804	71
615	788875	788946	789016	789087	789157	789228	789299	789369	789440	789510	71
616	789581	789651	789722	789792	789863	789933	790004	790074	790144	790215	70
617	790285	790356	790426	790496	790567	790637	790707	790778	790848	790918	70
618	790988	791059	791129	791199	791269	791340	791410	791480	791550	791620	70
619	791691	791761	791831	791901	791971	792041	792111	792181	792252	792322	70
620	792392	792462	792532	792602	792672	792742	792812	792882	792952	793022	70
621	793092	793162	793231	793301	793371	793441	793511	793581	793651	793721	70
622	793790	793860	793930	794000	794070	794139	794209	794279	794349	794418	70
623	794488	794558	794627	794697	794767	794836	794906	794976	795045	795115	70
624	795185	795254	795324	795393	795463	795532	795602	795671	795741	795811	69
625	795880	795949	796019	796088	796158	796227	796297	796366	796436	796505	69
626	796574	796644	796713	796782	796852	796921	796990	797060	797129	797198	69
627	797268	797337	797406	797475	797545	797614	797683	797752	797821	797890	69
628	797960	798029	798098	798167	798236	798305	798374	798443	798512	798582	69
629	798651	798720	798789	798858	798927	798996	799065	799134	799203	799272	69
630	799341	799409	799478	799547	799616	799685	799754	799823	799892	799961	69
631	800029	800098	800167	800236	800305	800373	800442	800511	800580	800648	69
632	800717	800786	800854	800923	800992	801060	801129	801198	801266	801335	69
633	801404	801472	801541	801609	801678	801747	801815	801884	801952	802021	69
634	802089	802158	802226	802295	802363	802432	802500	802568	802637	802705	68
635	802774	802842	802910	802979	803047	803116	803184	803252	803321	803389	68
636	803457	803525	803594	803662	803730	803798	803867	803935	804003	804071	68
637	804139	804208	804276	804344	804412	804480	804548	804616	804685	804753	68
638	804821	804889	804957	805025	805093	805161	805229	805297	805365	805433	68
639	805501	805569	805637	805705	805773	805841	805908	805976	806044	806112	68
	0	1	2	3	4	5	6	7	8	9	

TABLE XVIII.

LOGARITHMS OF NUMBERS.

No. 6400——7000 Log. 806180——845098

No.	0	1	2	3	4	5	6	7	8	9	Diff.
640	806180	806248	806316	806384	806451	806510	806587	806655	806723	806790	68
641	806858	806926	806994	807061	807129	807197	807264	807332	807400	807467	68
642	807535	807603	807670	807738	807806	807873	807941	808008	808076	808143	68
643	808211	808279	808346	808414	808481	808549	808616	808684	808751	808818	68
644	808886	808953	809021	809088	809156	809223	809290	809358	809425	809492	67
645	809560	809627	809694	809762	809829	809896	809964	810031	810698	810165	67
646	810233	810300	810367	810434	810501	810569	810636	810703	810770	810837	67
647	810904	810971	811038	811106	811173	811240	811307	811374	811441	811508	67
648	811575	811642	811709	811776	811843	811910	811977	812044	812111	812178	67
649	812245	812312	812378	812445	812512	812579	812646	812713	812780	812847	67
650	812913	812980	813047	813114	813181	813247	813314	813381	813448	813514	67
651	813581	813648	813714	813781	813848	813914	813981	814048	814114	814181	67
652	814248	814314	814381	814447	814514	814581	814647	814714	814780	814847	67
653	814913	814980	815046	815113	815179	815246	815312	815378	815445	815511	66
654	815578	815644	815711	815777	815843	815910	815976	816042	816109	816175	66
655	816241	816308	816374	816440	816506	816573	816639	816705	816771	816838	66
656	816904	816970	817036	817102	817169	817235	817301	817367	817433	817499	66
657	817565	817631	817698	817764	817830	817896	817962	818028	818094	818160	66
658	818226	818292	818358	818424	818490	818556	818622	818688	818754	818819	66
659	818885	818951	819017	819083	819149	819215	819281	819346	819412	819478	66
660	819544	819610	819675	819741	819807	819873	819939	820004	820070	820136	66
661	820201	820267	820333	820399	820464	820530	820595	820661	820727	820792	66
662	820858	820924	820989	821055	821120	821186	821251	821317	821382	821448	66
663	821514	821579	821644	821710	821775	821841	821906	821972	822037	822103	65
664	822168	822233	822299	822364	822430	822495	822560	822626	822691	822756	65
665	822822	822887	822952	823018	823083	823148	823213	823279	823344	823409	65
666	823474	823539	823605	823670	823735	823800	823865	823930	823996	824061	65
667	824126	824191	824256	824321	824386	824451	824516	824581	824646	824711	65
668	824776	824841	824906	824971	825036	825101	825166	825231	825296	825361	65
669	825426	825491	825556	825621	825686	825751	825815	825880	825945	826010	65
670	826075	826140	826204	826269	826334	826399	826464	826528	826593	826658	65
671	826723	826787	826852	826917	826981	827046	827111	827175	827240	827305	65
672	827369	827434	827498	827563	827628	827692	827757	827821	827886	827951	65
673	828015	828080	828144	828209	828273	828338	828402	828467	828531	828595	64
674	828660	828724	828789	828853	828918	828982	829046	829111	829175	829239	64
675	829304	829368	829432	829497	829561	829625	829690	829754	829818	829882	64
676	829947	830011	830075	830139	830204	830268	830332	830396	830460	830525	64
677	830589	830653	830717	830781	830845	830909	830973	831037	831102	831166	64
678	831230	831294	831358	831422	831486	831550	831614	831678	831742	831806	64
679	831870	831934	831998	832062	832126	832189	832253	832317	832381	832445	64
680	832509	832573	832637	832700	832764	832828	832892	832956	833020	833083	64
681	833147	833211	833275	833338	833402	833466	833530	833593	833657	833721	64
682	833784	833848	833912	833975	834039	834103	834166	834230	834293	834357	64
683	834421	834484	834548	834611	834675	834739	834802	834866	834929	834993	64
684	835056	835120	835183	835247	835310	835373	835437	835500	835564	835627	63
685	835691	835754	835817	835881	835944	836007	836071	836134	836197	836261	63
686	836324	836387	836451	836514	836577	836641	836704	836767	836830	836894	63
687	836957	837020	837083	837146	837210	837273	837336	837399	837462	837525	63
688	837588	837652	837715	837778	837841	837904	837967	838030	838093	838156	63
689	838219	838282	838345	838408	838471	838534	838597	838660	838723	838786	63
690	838849	838912	838975	839038	839101	839164	839227	839289	839352	839415	63
691	839478	839541	839604	839667	839729	839792	839855	839918	839981	840043	63
692	840106	840169	840232	840294	840357	840420	840482	840545	840608	840671	63
693	840733	840796	840859	840921	840984	841046	841109	841172	841234	841297	63
694	841359	841422	841485	841547	841610	841672	841735	841797	841860	841922	63
695	841985	842047	842110	842172	842235	842297	842360	842422	842484	842547	62
696	842609	842672	842734	842796	842859	842921	842983	843046	843108	843170	62
697	843233	843295	843357	843420	843482	843544	843606	843669	843731	843793	62
698	843855	843918	843980	844042	844104	844166	844229	844291	844353	844415	62
699	844477	844539	844601	844664	844726	844788	844850	844912	844974	845036	62
	0	1	2	3	4	5	6	7	8	9	

TABLE XVIII.

LOGARITHMS OF NUMBERS.

No. 7000 —— 7600 Log. 845098 —— 880814

No.	0	1	2	3	4	5	6	7	8	9	Diff.
700	845098	845160	845222	845284	845346	845408	845470	845532	845594	845656	62
701	845718	845780	845842	845904	845966	846028	846090	846151	846213	846275	62
702	846337	846399	846461	846523	846584	846646	846708	846770	846832	846894	62
703	846955	847017	847079	847141	847202	847264	847326	847388	847449	847511	62
704	847573	847634	847696	847758	847819	847881	847943	848004	848066	848127	62
705	848189	848251	848312	848374	848435	848497	848559	848620	848682	848743	62
706	848805	848866	848928	848989	849051	849112	849174	849235	849296	849358	61
707	849419	849481	849542	849604	849665	849726	849788	849849	849911	849972	61
708	850033	850095	850156	850217	850279	850340	850401	850462	850524	850585	61
709	850646	850707	850769	850830	850891	850952	851014	851075	851136	851197	61
710	851258	851320	851381	851442	851503	851564	851625	851686	851747	851808	61
711	851870	851931	851992	852053	852114	852175	852236	852297	852358	852419	61
712	852480	852541	852602	852663	852724	852785	852846	852907	852968	853029	61
713	853090	853150	853211	853272	853333	853394	853455	853516	853576	853637	61
714	853698	853759	853820	853881	853941	854002	854063	854124	854185	854245	61
715	854306	854367	854427	854488	854549	854610	854670	854731	854792	854852	61
716	854913	854974	855034	855095	855156	855216	855277	855337	855398	855459	61
717	855519	855580	855640	855701	855761	855822	855882	855943	856003	856064	61
718	856124	856185	856245	856306	856366	856427	856487	856548	856608	856668	60
719	856729	856789	856850	856910	856970	857031	857091	857151	857212	857272	60
720	857332	857393	857453	857513	857574	857634	857694	857754	857815	857875	60
721	857935	857995	858056	858116	858176	858236	858297	858357	858417	858477	60
722	858537	858597	858657	858718	858778	858838	858898	858958	859018	859078	60
723	859138	859198	859258	859318	859378	859438	859499	859559	859619	859679	60
724	859739	859799	859858	859918	859978	860038	860098	860158	860218	860278	60
725	860338	860398	860458	860518	860578	860637	860697	860757	860817	860877	60
726	860937	860996	861056	861116	861176	861236	861295	861355	861415	861475	60
727	861534	861594	861654	861714	861773	861833	861893	861952	862012	862072	60
728	862131	862191	862251	862310	862370	862430	862489	862549	862608	862668	60
729	862728	862787	862847	862906	862966	863025	863085	863144	863204	863263	60
730	863323	863382	863442	863501	863561	863620	863680	863739	863798	863858	59
731	863917	863977	864036	864096	864155	864214	864274	864333	864392	864452	59
732	864511	864570	864630	864689	864748	864808	864867	864926	864985	865045	59
733	865104	865163	865222	865282	865341	865400	865459	865518	865578	865637	59
734	865696	865755	865814	865874	865933	865992	866051	866110	866169	866228	59
735	866287	866346	866405	866465	866524	866583	866642	866701	866760	866819	59
736	866878	866937	866996	867055	867114	867173	867232	867291	867350	867409	59
737	867467	867526	867585	867644	867703	867762	867821	867880	867939	867998	59
738	868056	868115	868174	868233	868292	868350	868409	868468	868527	868586	59
739	868644	868703	868762	868821	868879	868938	868997	869056	869114	869173	59
740	869232	869290	869349	869408	869466	869525	869584	869642	869701	869760	59
741	869818	869877	869935	869994	870053	870111	870170	870228	870287	870345	59
742	870404	870462	870521	870579	870638	870696	870755	870813	870872	870930	58
743	870989	871047	871106	871164	871223	871281	871339	871398	871456	871515	58
744	871573	871631	871690	871748	871806	871865	871923	871981	872040	872098	58
745	872156	872215	872273	872331	872389	872448	872506	872564	872622	872681	58
746	872739	872797	872855	872913	872972	873080	873088	873146	873204	873262	58
747	873321	873379	873437	873495	873553	873611	873669	873727	873785	873844	58
748	873902	873960	874018	874076	874134	874192	874250	874308	874366	874424	58
749	874482	874540	874598	874656	874714	874772	874830	874887	874945	875003	58
750	875061	875119	875177	875235	875293	875351	875409	875466	875524	875582	58
751	875640	875698	875756	875813	875871	875929	875987	876045	876102	876160	58
752	876218	876276	876333	876391	876449	876507	876564	876622	876680	876737	58
753	876795	876853	876910	876968	877026	877083	877141	877198	877256	877314	58
754	877371	877429	877486	877544	877602	877659	877717	877774	877832	877889	58
755	877947	878004	878062	878119	878177	878234	878292	878349	878407	878464	57
756	878522	878579	878637	878694	878751	878809	878866	878924	878981	879038	57
757	879096	879153	879211	879268	879325	879383	879440	879497	879555	879612	57
758	879669	879726	879784	879841	879898	879956	880013	880070	880127	880185	57
759	880242	880299	880356	880413	880471	880528	880585	880642	880699	880756	57
	0	1	2	3	4	5	6	7	8	9	

No. 7600 —— 8200 Log. 880814 —— 913814

No.	0	1	2	3	4	5	6	7	8	9	Diff.
760	880814	880871	880928	880985	881042	881099	881156	881213	881270	881328	57
761	881385	881442	881499	881556	881613	881670	881727	881784	881841	881898	57
762	881955	882012	882069	882126	882183	882240	882297	882354	882411	882468	57
763	882524	882581	882638	882695	882752	882809	882866	882923	882980	883037	57
764	883093	883150	883207	883264	883321	883377	883434	883491	883548	883605	57
765	883661	883718	883775	883832	883888	883945	884002	884059	884115	884172	57
766	884229	884285	884342	884399	884455	884512	884569	884625	884682	884739	57
767	884795	884852	884909	884965	885022	885078	885135	885192	885248	885305	57
768	885361	885418	885474	885531	885587	885644	885700	885757	885813	885870	57
769	885926	885983	886039	886096	886152	886209	886265	886321	886378	886434	56
770	886491	886547	886604	886660	886716	886773	886829	886885	886942	886998	56
771	887054	887111	887167	887223	887280	887336	887392	887449	887505	887561	56
772	887617	887674	887730	887786	887842	887898	887955	888011	888067	888123	56
773	888179	888236	888292	888348	888404	888460	888516	888573	888629	888685	56
774	888741	888797	888853	888909	888965	889021	889077	889134	889190	889246	56
775	889302	889358	889414	889470	889526	889582	889638	889694	889750	889806	56
776	889862	889918	889974	890030	890086	890141	890197	890253	890309	890365	56
777	890421	890477	890533	890589	890644	890700	890756	890812	890868	890924	56
778	890980	891035	891091	891147	891203	891259	891314	891370	891426	891482	56
779	891537	891593	891649	891705	891760	891816	891872	891928	891983	892039	56
780	892095	892150	892206	892262	892317	892373	892429	892484	892540	892595	56
781	892651	892707	892762	892818	892873	892929	892985	893040	893096	893151	56
782	893207	893262	893318	893373	893429	893484	893540	893595	893651	893706	56
783	893762	893817	893873	893928	893984	894039	894094	894150	894205	894261	55
784	894316	894371	894427	894482	894538	894593	894648	894704	894759	894814	55
785	894870	894925	894980	895036	895091	895146	895201	895257	895312	895367	55
786	895423	895478	895533	895588	895643	895699	895754	895809	895864	895920	55
787	895975	896030	896085	896140	896195	896251	896306	896361	896416	896471	55
788	896526	896581	896636	896692	896747	896802	896857	896912	896967	897022	55
789	897077	897132	897187	897242	897297	897352	897407	897462	897517	897572	55
790	897627	897682	897737	897792	897847	897902	897957	898012	898067	898122	55
791	898176	898231	898286	898341	898396	898451	898506	898561	898615	898670	55
792	898725	898780	898835	898890	898944	898999	899054	899109	899164	899218	55
793	899273	899328	899383	899437	899492	899547	899602	899656	899711	899766	55
794	899820	899875	899930	899985	900039	900094	900149	900203	900258	900312	55
795	900367	900422	900476	900531	900586	900640	900695	900749	900804	900858	55
796	900913	900968	901022	901077	901131	901186	901240	901295	901349	901404	55
797	901458	901513	901567	901622	901676	901731	901785	901840	901894	901948	54
798	902003	902057	902112	902166	902221	902275	902329	902384	902438	902491	54
799	902547	902601	902655	902710	902764	902818	902873	902927	902981	903036	54
800	903090	903144	903198	903253	903307	903361	903416	903470	903524	903578	54
801	903632	903687	903741	903795	903849	903903	903958	904012	904066	904120	54
802	904174	904228	904283	904337	904391	904445	904499	904553	904607	904661	54
803	904715	904770	904824	904878	904932	904986	905040	905094	905148	905202	54
804	905256	905310	905364	905418	905472	905526	905580	905634	905688	905742	54
805	905796	905850	905904	905958	906012	906065	906119	906173	906227	906281	54
806	906335	906389	906443	906497	906550	906604	906658	906712	906766	906820	54
807	906873	906927	906981	907035	907089	907142	907196	907250	907304	907358	54
808	907411	907465	907519	907573	907626	907680	907734	907787	907841	907895	54
809	907948	908002	908056	908109	908163	908217	908270	908324	908378	908431	54
810	908485	908539	908592	908646	908699	908753	908807	908860	908914	908967	54
811	909021	909074	909128	909181	909235	909288	909342	909395	909449	909502	54
812	909556	909609	909663	909716	909770	909823	909877	909930	909984	910037	53
813	910090	910144	910197	910251	910304	910358	910411	910464	910518	910571	53
814	910624	910678	910731	910784	910838	910891	910944	910998	911051	911104	53
815	911158	911211	911264	911317	911371	911424	911477	911530	911584	911637	53
816	911690	911743	911797	911850	911903	911956	912009	912063	912116	912169	53
817	912222	912275	912328	912381	912435	912488	912541	912594	912647	912700	53
818	912753	912806	912859	912913	912966	913019	913072	913125	913178	913231	53
819	913284	913337	913390	913443	913496	913549	913602	913655	913708	913761	53
	0	1	2	3	4	5	6	7	8	9	

TABLE XVIII.

LOGARITHMS OF NUMBERS.

No. 8200 ——8800   Log. 913814 ——944483

No.	0	1	2	3	4	5	6	7	8	9	Diff.
820	913814	913867	913920	913973	914026	914079	914131	914184	914237	914290	53
821	914343	914396	914449	914502	914555	914608	914660	914713	914766	914819	53
822	914872	914925	914977	915030	915083	915136	915189	915241	915294	915347	53
823	915400	915453	915505	915558	915611	915664	915716	915769	915822	915874	53
824	915927	915980	916033	916085	916138	916191	916243	916296	916349	916401	53
825	916454	916507	916559	916612	916664	916717	916770	916822	916875	916927	53
826	916980	917033	917085	917138	917190	917243	917295	917348	917400	917453	53
827	917505	917558	917610	917663	917715	917768	917820	917873	917925	917978	52
828	918030	918083	918135	918188	918240	918292	918345	918397	918450	918502	52
829	918555	918607	918659	918712	918764	918816	918869	918921	918973	919026	52
830	919078	919130	919183	919235	919287	919340	919392	919444	919496	919549	52
831	919601	919653	919705	919758	919810	919862	919914	919967	920019	920071	52
832	920123	920175	920228	920280	920332	920384	920436	920489	920541	920593	52
833	920645	920697	920749	920801	920853	920906	920958	921010	921062	921114	52
834	921166	921218	921270	921322	921374	921426	921478	921530	921582	921634	52
835	921686	921738	921790	921842	921894	921946	921998	922050	922102	922154	52
836	922206	922258	922310	922362	922414	922466	922518	922570	922622	922674	52
837	922725	922777	922829	922881	922933	922985	923037	923088	923140	923192	52
838	923244	923296	923348	923399	923451	923503	923555	923607	923658	923710	52
839	923762	923814	923865	923917	923969	924021	924072	924124	924176	924228	52
840	924279	924331	924383	924434	924486	924538	924589	924641	924693	924744	52
841	924796	924848	924899	924951	925002	925054	925106	925157	925209	925260	52
842	925312	925364	925415	925467	925518	925570	925621	925673	925724	925776	52
843	925828	925879	925931	925982	926034	926085	926137	926188	926239	926291	51
844	926342	926394	926445	926497	926548	926600	926651	926702	926754	926805	51
845	926857	926908	926959	927011	927062	927114	927165	927216	927268	927319	51
846	927370	927422	927473	927524	927576	927627	927678	927730	927781	927832	51
847	927883	927935	927986	928037	928088	928140	928191	928242	928293	928345	51
848	928396	928447	928498	928549	928601	928652	928703	928754	928805	928856	51
849	928908	928959	929010	929061	929112	929163	929214	929266	929317	929368	51
850	929419	929470	929521	929572	929623	929674	929725	929776	929827	929878	51
851	929930	929981	930032	930083	930134	930185	930236	930287	930338	930389	51
852	930440	930491	930541	930592	930643	930694	930745	930796	930847	930898	51
853	930949	931000	931051	931102	931153	931203	931254	931305	931356	931407	51
854	931458	931509	931560	931610	931661	931712	931763	931814	931864	931915	51
855	931966	932017	932068	932118	932169	932220	932271	932321	932372	932423	51
856	932474	932524	932575	932626	932677	932727	932778	932829	932879	932930	51
857	932981	933031	933082	933133	933183	933234	933285	933335	933386	933437	51
858	933487	933538	933588	933639	933690	933740	933791	933841	933892	933943	51
859	933993	934044	934094	934145	934195	934246	934296	934347	934397	934448	51
860	934498	934549	934599	934650	934700	934751	934801	934852	934902	934953	50
861	935003	935054	935104	935154	935205	935255	935306	935356	935506	935457	50
862	935507	935558	935608	935658	935709	935759	935809	935860	935910	935960	50
863	936011	936061	936111	936162	936212	936262	936313	936363	936413	936463	50
864	936514	936564	936614	936664	936715	936765	936815	936865	936916	936966	50
865	937016	937066	937116	937167	937217	937267	937317	937367	937418	937468	50
866	937518	937568	937618	937668	937718	937769	937819	937869	937919	937969	50
867	938019	938069	938119	938169	938219	938269	938319	938370	938420	938470	50
868	938520	938570	938620	938670	938720	938770	938820	938870	938920	938970	50
869	939020	939070	939120	939170	939220	939270	939319	939360	939419	939469	50
870	939519	939569	939619	939669	939719	939769	939819	939868	939918	939968	50
871	940018	940068	940118	940168	940218	940267	940317	940367	940417	940467	50
872	940516	940566	940616	940666	940716	940765	940815	940865	940915	940964	50
873	941014	941064	941114	941163	941213	941263	941313	941362	941412	941462	50
874	941511	941561	941611	941660	941710	941760	941809	941859	941909	941958	50
875	942008	942058	942107	942157	942206	942256	942306	942355	942405	942454	50
876	942504	942554	942603	942653	942702	942752	942801	942355	942900	942950	50
877	943000	943049	943099	943148	943198	943247	943297	943346	943396	943445	49
878	943494	943544	943593	943643	943692	943742	943791	943841	943890	943939	49
879	943989	944038	944088	944137	944186	944236	944285	944335	944384	944433	49
	0	1	2	3	4	5	6	7	8	9	

TABLE XVIII.

LOGARITHMS OF NUMBERS.

No. 8800——9400 Log. 944483——973128

No.	0	1	2	3	4	5	6	7	8	9	Diff.
880	944483	944532	944581	944631	944680	944729	944779	944828	944877	944927	49
881	944976	945025	945074	945124	945173	945222	945272	945321	945370	945419	49
882	945469	945518	945567	945616	945665	945715	945764	945813	945862	945911	49
883	945961	946010	946059	946108	946157	946207	946256	946305	946354	946403	49
884	946452	946501	946550	946600	946649	946698	946747	946796	946845	946894	49
885	946943	946992	947041	947090	947139	947189	947238	947287	947336	947385	49
886	947434	947483	947532	947581	947630	947679	947728	947777	947826	947875	49
887	947924	947973	948021	948070	948119	948168	948217	948266	948315	948364	49
888	948413	948462	948511	948560	948608	948657	948706	948755	948804	948853	49
889	948902	948951	948999	949048	949097	949146	949195	949244	949292	949341	49
890	949390	949439	949488	949536	949585	949634	949683	949731	949780	949829	49
891	949878	949926	949975	950024	950073	950121	950170	950219	950267	950316	49
892	950365	950413	950462	950511	950560	950608	950657	950705	950754	950803	49
893	950851	950900	950949	950997	951046	951095	951143	951192	951240	951289	49
894	951337	951386	951435	951483	951532	951580	951629	951677	951726	951774	49
895	951823	951872	951920	951969	952017	952066	952114	952163	952211	952259	48
896	952308	952356	952405	952453	952502	952550	952599	952647	952696	952744	48
897	952792	952841	952889	952938	952986	953034	953083	953131	953180	953228	48
898	953276	953325	953373	953421	953470	953518	953566	953615	953663	953711	48
899	953760	953808	953856	953905	953953	954001	954049	954998	954146	954494	48
900	954242	954291	954339	954387	954435	954484	954532	954580	954628	954677	48
901	954725	954773	954821	954869	954918	954966	955014	955062	955110	955158	48
902	955206	955255	955303	955351	955399	955447	955495	955543	955592	955640	48
903	955688	055736	955784	955832	955880	955928	955976	956024	956072	956120	48
904	956168	956216	956264	956312	956361	956409	956457	956505	956553	956601	48
905	956649	956697	956745	956792	956840	956888	956936	956984	957032	957080	48
906	957128	957176	957224	957272	957320	957368	957416	957464	957511	957559	48
907	957607	957655	957703	957751	957799	957847	957894	957942	957990	958038	48
908	958086	958134	958181	958229	958277	958325	958373	958420	958468	958516	48
909	958564	958612	958659	958707	958755	958803	958850	958898	958946	958994	48
910	959041	959089	959137	959184	959232	959280	959328	959375	959423	959471	48
911	959518	959566	959614	959661	959709	959757	959804	959852	959900	959947	48
912	959995	960042	960090	960138	960185	960233	960281	960328	960376	960423	48
913	960471	960518	960566	960613	960661	960709	960756	960804	960851	960899	48
914	960946	960994	961041	961089	961136	961184	961231	961279	961326	961374	48
915	961421	961469	961516	961563	961611	961658	961706	961753	961801	961848	47
916	961895	961943	961990	962038	962085	962132	962180	962227	962275	962322	47
917	962369	962417	962464	962511	962559	962606	962653	962701	962748	962795	47
918	962843	962890	962937	962985	963032	963079	963126	963174	963221	963268	47
919	963315	963363	963410	963457	963504	963552	963599	963646	963693	963741	47
920	963788	963835	963882	963929	963977	964024	964071	964118	964165	964212	47
921	964260	964307	964354	964401	964448	964495	964542	964590	964637	964684	47
922	964731	964778	964825	964872	964919	964966	965013	965060	965108	965155	47
923	965202	965249	965296	965343	965390	965437	965484	965531	965578	965625	47
924	965672	965716	965766	965813	965860	965907	965954	966001	966048	966095	47
925	966142	966189	966236	966283	966329	966376	966423	966470	966517	966564	47
926	966611	966658	966705	966752	966798	966845	966892	966939	966986	967033	47
927	967080	967127	967173	967220	967267	967314	967361	967408	967454	967501	47
928	967548	967595	967642	967688	967735	967782	967829	967875	967922	967969	47
929	968016	968062	968109	968156	968203	968249	968296	968343	968389	968436	47
930	968483	968530	968576	968623	968670	968716	968763	968810	968856	968903	47
931	968950	968996	969043	969090	969136	969183	969229	969276	969323	969369	47
932	969416	969462	969509	969556	969602	969649	969695	969742	969788	969835	47
933	969882	969928	969975	970021	970068	970114	970161	970207	970254	970300	47
934	970347	970393	970440	970486	970533	970579	970626	970672	970719	970765	47
935	970812	970858	970904	970951	970997	971044	971090	971137	971183	971229	46
936	971276	971322	971369	971415	971461	971508	971554	971600	971647	971693	46
937	971740	971786	971832	971879	971925	971971	972018	972064	972110	972156	46
938	972203	972249	972295	972342	972388	972434	972480	972527	972573	972619	46
939	972666	972712	972758	972804	972851	972897	972943	972989	973035	973082	46
	0	1	2	3	4	5	6	7	8	9	

TABLE XVIII.

LOGARITHMS OF NUMBERS.

No. 9400.——10000 Log. 973128——000000

No.	0	1	2	3	4	5	6	7	8	9	Diff.
940	973128	973174	973220	973266	973313	973359	973405	973451	973497	973543	46
941	973590	973636	973682	973728	973774	973820	973866	973913	973959	974005	46
942	974051	974097	974143	974189	974235	974281	974327	974373	974420	974466	46
943	974512	974558	974604	974650	974696	974742	974788	974834	974880	974926	46
944	974972	975018	975064	975110	975156	975202	975248	975294	975340	975386	46
945	975432	975478	975524	975570	975616	975661	975707	975753	975799	975845	46
946	975891	975937	975983	976029	976075	976121	976166	976212	976258	976304	46
947	976350	976396	976442	976487	976533	976579	976625	976671	976717	976762	46
948	976808	976854	976900	976946	976991	977037	977083	977120	977175	977220	46
949	977266	977312	977358	977403	977449	977495	977541	977586	977632	977678	46
950	977724	977769	977815	977861	977906	977952	977998	978043	978089	978135	46
951	978180	978226	978272	978317	978363	978409	978454	978500	978546	978591	46
952	978637	978683	978728	978774	978819	978865	978911	978956	979002	979047	46
953	979093	979138	979184	979230	979275	979321	979366	979412	979457	979503	46
954	979548	979594	979639	979685	979730	979776	979821	979867	979912	979958	46
955	980003	980049	980094	980140	980185	980231	980276	980322	980367	980412	45
956	980458	980503	980549	980594	980640	980685	980730	980776	980821	980867	45
957	980912	980957	981003	981048	981093	981139	981184	981229	981275	981320	45
958	981365	981411	981456	981501	981547	981592	981637	981683	981728	981773	45
959	981819	981864	981909	981954	982000	982045	982090	982135	982181	982226	45
960	982271	982316	982362	982407	982452	982497	982543	982588	982633	982678	45
961	982723	982769	982814	982859	982904	982949	982994	983040	983085	983130	45
962	983175	983220	983265	983310	983356	983401	983446	983491	983536	983581	45
963	983626	983671	983716	983762	983807	983852	983897	983942	983987	984032	45
964	984077	984122	984167	984212	984257	984302	984347	984392	984437	984482	45
965	984527	984572	984617	984662	984707	984752	984797	984842	984887	984932	45
966	984977	985022	985067	985112	985157	985202	985247	985292	985337	985382	45
967	985426	985471	985516	985561	985606	985651	985696	985741	985786	985830	45
968	985875	985920	985965	986010	986055	986100	986144	986189	986234	986279	45
969	986324	986369	986413	986458	986503	986548	986593	986637	986682	986727	45
970	986772	986816	986861	986906	986951	986995	987040	987085	987130	987174	45
971	987219	987264	987309	987353	987398	987443	987487	987532	987577	987622	45
972	987666	987711	987756	987800	987845	987890	987934	987979	988024	988068	45
973	988113	988157	988202	988247	988291	988336	988381	988425	988470	988514	45
974	988559	988603	988648	988693	988737	988782	988826	988871	988915	988960	45
975	989005	989049	989094	989138	989183	989227	989272	989316	989361	989405	45
976	989450	989494	989539	989583	989628	989672	989717	989761	989806	989850	44
977	989895	989939	989983	990028	990072	990117	990161	990206	990250	990294	44
978	990339	990383	990428	990472	990516	990561	990605	990650	990694	990738	44
679	990783	990827	990871	990916	990960	991004	991049	991093	991137	991182	44
980	991226	991270	991315	991359	991403	991448	991492	991536	991580	991625	44
981	991669	991713	991757	991802	991846	991890	991934	991979	992023	992067	44
982	992111	992156	992200	992244	992288	992333	992377	992421	992465	992509	44
983	992553	992598	992642	992686	992730	992774	992818	992863	992907	992951	44
984	992995	993039	993083	993127	993172	993216	993260	993304	993348	993392	44
985	993436	993480	993524	993568	993613	993657	993701	993745	993789	993833	44
986	993877	993921	993965	994009	994053	994097	994141	994185	994229	994273	44
987	994317	994361	994405	994449	994493	994537	994581	994625	994669	994713	44
988	994757	994801	994845	994889	994933	994977	995021	995064	995108	995152	44
989	995196	995240	995284	995328	995372	995416	995460	995504	995547	995591	44
990	995635	995679	995723	995767	995811	995854	995898	995942	995986	996030	44
991	996074	996117	996161	996205	996249	996293	996336	996380	996424	996468	44
992	996512	996555	996599	996643	996687	996730	996774	996818	996862	996905	44
993	996949	996993	997037	997080	997124	997168	997212	997255	997299	997343	44
994	997386	997430	997474	997517	997561	997605	997648	997692	997736	997779	44
995	997823	997867	997910	997954	997998	998041	998085	998128	998172	998216	44
996	998259	998303	998346	998390	998434	998477	998521	998564	998608	998652	44
997	998695	998739	998782	998826	998869	998913	998956	999000	999043	999087	44
998	999130	999174	999218	999261	999305	999348	999392	999435	999478	999522	44
999	999565	999609	999652	999696	999739	999783	999826	999870	999913	999957	43
	0	1	2	3	4	5	6	7	8	9	

TABLE XIX.

LOGARITHMIC SINES.

Sine 0 Degree.

M	0′	10″	20″	30″	40″	50″		Diff.
0		5.685575	5.986605	6.162696	6.287635	6.384545	59	
1	6.463726	6.530673	6.588665	6.639817	6.685575	6.726967	58	
2	6.764756	6.799518	6.831703	6.861666	6.889695	6.916024	57	
3	6.940847	6.964328	6.986605	7.007794	7.027997	7.047303	56	
4	7.065786	7.083515	7.100548	7.116938	7.132733	7.147973	55	
5	7.162696	7.176936	7.190725	7.204089	7.217054	7.229643	54	
6	7.241877	7.253776	7.265358	7.276639	7.287635	7.298358	53	
7	7.308824	7.319043	7.329027	7.338787	7.348332	7.357672	52	
8	7.366816	7.375770	7.384544	7.393145	7.401578	7.409850	51	
9	7.417968	7.425937	7 433762	7.441449	7.449002	7.456126	50	
10	7.463725	7.470904	7.477966	7.484915	7.491754	7.498487	49	6894
11	7.505118	7.511649	7.518083	7.524423	7.530672	7.536832	48	6294
12	7.542906	7.548897	7.554806	7.560635	7.566387	7.572065	47	5791
13	7.577668	7.583201	7.588664	7.594059	7.599388	7.604652	46	5362
14	7.609853	7.614993	7.620072	7.625093	7.630056	7.634963	45	4992
15	7.639816	7.644615	7.649361	7.654056	7.658701	7.663297	44	4670
16	7.667844	7.672345	7.676799	7.681208	7.685573	7.689894	43	4387
17	7.694173	7.698410	7.702606	7.706762	7.710879	7.714957	42	4136
18	7.718997	7.722999	7.726965	7.730896	7.734791	7.738651	41	3913
19	7.742477	7.746270	7.750031	7.753758	7.757454	7.761119	40	3712
20	7.764754	7.768358	7.771932	7.775477	7.778994	7.782482	39	3531
21	7.785943	7.789376	7.792782	7.796162	7.799515	7.802843	38	3366
22	7.806146	7.809423	7.812677	7.815905	7.819111	7.822292	37	3217
23	7.825451	7.828586	7.831700	7.834791	7.837860	7.840907	36	3030
24	7.843934	7.846939	7.849924	7.852888	7.855833	7.858757	35	2954
25	7.861662	7.864548	7.867414	7.870262	7.873092	7.875902	34	2838
26	7.878695	7.881470	7.884228	7.886968	7.889690	7.892396	33	2731
27	7.895085	7.897758	7.900414	7.903054	7.905678	7.908287	32	2632
28	7.910879	7.913457	7.916019	7.918566	7.921098	7.923616	31	2540
29	7.926119	7.928608	7.931082	7.933543	7.935989	7.938422	30	2453
30	7.940842	7.943248	7.945641	7.948020	7.950387	7.952741	29	2373
31	7.955082	7.957410	7.959727	7.962031	7.964322	7.966602	28	2297
32	7.968870	7.971126	7 973370	7.975603	7.977824	7.980034	27	2227
33	7.982233	7.984421	7.986598	7.988764	7.990919	7.993064	26	2161
34	7.995198	7.997322	7.999435	8.001538	8.003631	8.005714	25	2098
35	8.007787	8.009850	8.011903	8.013947	8.015981	8.018005	24	2039
36	8.020021	8.022027	8.024023	8.026011	8.027989	8.029959	23	1983
37	8.031919	8.033871	8.035814	8.037749	8.039675	8.041592	22	1930
38	8.043501	8.045401	8.047294	8.049178	8.051054	8.052922	21	1880
39	8.054781	8.056633	8.058477	8.060314	8.062142	8.063963	20	1832
40	8.065776	8.067582	8.069380	8.071171	8.072955	8.074731	19	1787
41	8.076500	8.078261	8.080016	8.081764	8.083504	8.085238	18	1744
42	8.086965	8.088684	8.090398	8.092104	8.093804	8.095497	17	1703
43	8.097183	8.098863	8.100537	8.102204	8.103864	8.105519	16	1664
44	8.107167	8.108809	8.110444	8.112074	8.113697	8.115315	15	1626
45	8.116926	8.118532	8.120131	8.121725	8.123313	8.124895	14	1590
46	8.126471	8.128042	8.129606	8.131166	8.132720	8.134268	13	1556
47	8.135810	8.137348	8.138879	8.140406	8.141927	8.143443	12	1524
48	8.144953	8.146458	8.147959	8.149453	8.150943	8.152428	11	1492
49	8.153907	8.155382	8.156852	8.158316	8.159776	8.161231	10	1462
50	8.162681	8.164126	8.165566	8.167002	8.168433	8.169859	9	1432
51	8.171280	8.172697	8.174109	8.175517	8.176920	8.178319	8	1405
52	8.179713	8.181102	8.182488	8.183868	8.185245	8.186617	7	1379
53	8.187985	8.189348	8.190707	8.192062	8.193413	8.194760	6	1353
54	8.196102	8.197440	8.198774	8.200104	8.201430	8.202752	5	1328
55	8.204070	8.205384	8.206694	8.208000	8.209302	8.210601	4	1304
56	8.211895	8.213185	8.214472	8.215755	8.217034	8.218309	3	1281
57	8.219581	8.220849	8.222113	8.223374	8.224631	8.225884	2	1258
58	8.227133	8.228380	8.229622	8.230861	8.232096	8.233328	1	1237
59	8.234557	8.235782	8.237003	8.238221	8.239436	8.240647	0	1216
	60″	50	40″	30″	20″	10″	M	

Co-sine 89 Degrees.

TABLE XIX.

LOGARITHMIC TANGENTS.

Tangent 0 Degree.

M	0″	10″	20″	30″	40″	50″		Diff.
0		5.685575	5.986605	6.162696	6.287635	6.384545	59	
1	6.463726	6.530673	6.588665	6.639817	6.685575	6.726968	58	
2	6.764756	6.799518	6.831703	6.861666	6.889695	6.916024	57	
3	6.940847	6.961329	6.986605	7.007794	7.027998	7.047303	56	
4	7.065786	7.083515	7.100548	7.116939	7.132733	7.147973	55	
5	7.162696	7.176937	7.190725	7.204089	7.217054	7.229643	54	
6	7.241878	7.253777	7.265359	7.276640	7.287635	7.298359	53	
7	7.308825	7.319044	7.329028	7.338788	7.348333	7.357673	52	
8	7.366817	7.375772	7.384546	7.393146	7.401579	7.409852	51	
9	7.417970	7.425939	7.433764	7.441451	7.449004	7.456428	50	
10	7.463727	7.470906	7.477968	7.484917	7.491756	7.498490	49	6894
11	7.505120	7.511651	7.518085	7.524426	7.530675	7.536835	48	6294
12	7.542909	7.548900	7.554808	7.560638	7.566390	7.572068	47	5791
13	7.577671	7.583204	7.588667	7.594062	7.599391	7.604655	46	5362
14	7.609857	7.614996	7.620076	7.625097	7.630060	7.634968	45	4992
15	7.639820	7.644619	7.649366	7.654061	7.658706	7.663301	44	4670
16	7.667849	7.672350	7.676804	7.681213	7.685578	7.689900	43	4387
17	7.694179	7.698416	7.702612	7.706768	7.710885	7.714962	42	4136
18	7.719003	7.723005	7.726972	7.730902	7.734797	7.738658	41	3913
19	7.742484	7.746277	7.750037	7.753765	7.757462	7.761127	40	3712
20	7.764761	7.768365	7.771940	7.775485	7.779002	7.782490	39	3531
21	7.785951	7.789384	7.792790	7.796170	7.799524	7.802852	38	3367
22	7.806155	7.809432	7.812686	7.815915	7.819120	7.822302	37	3217
23	7.825460	7.828596	7.831710	7.834801	7.837870	7.840918	36	3080
24	7.843944	7.846950	7.849935	7.852900	7.855844	7.858769	35	2954
25	7.861674	7.864560	7.867426	7.870274	7.873104	7.875915	34	2839
26	7.878708	7.881483	7.884240	7.886981	7.889704	7.892410	33	2732
27	7.895099	7.897771	7.900428	7.903068	7.905692	7.908301	32	2632
28	7.910894	7.913471	7.916034	7.918581	7.921113	7.923631	31	2540
29	7.926134	7.928623	7.931098	7.933559	7.936006	7.938439	30	2454
30	7.940858	7.943265	7.945657	7.948037	7.950404	7.952758	29	2373
31	7.955100	7.957428	7.959745	7.962049	7.964341	7.966621	28	2298
32	7.968880	7.971145	7.973389	7.975622	7.977844	7.980054	27	2227
33	7.982253	7.984441	7.986618	7.988785	7.990940	7.993085	26	2161
34	7.995219	7.997343	7.999456	8.001560	8.003653	8.005736	25	2098
35	8.007809	8.009872	8.011926	8.013970	8.016004	8.018029	24	2039
36	8.020044	8.022051	8.024047	8.026035	8.028014	8.029984	23	1983
37	8.031945	8.033897	8.035840	8.037775	8.039701	8.041618	22	1930
38	8.043527	8.045428	8.047321	8.049205	8.051081	8.052949	21	1880
39	8.054809	8.056661	8.058506	8.060342	8.062171	8.063992	20	1833
40	8.065806	8.067612	8.069410	8.071201	8.072985	8.074761	19	1787
41	8.076531	8.078293	8.080047	8.081795	8.083536	8.085270	18	1744
42	8.086997	8.088717	8.090430	8.092137	8.093837	8.095530	17	1703
43	8.097217	8.098897	8.100571	8.102239	8.103899	8.105554	16	1664
44	8.107202	8.108845	8.110481	8.112110	8.113734	8.115352	15	1627
45	8.116963	8.118569	8.120169	8.121763	8.123351	8.124933	14	1591
46	8.126510	8.128081	8.129646	8.131206	8.132760	8.134308	13	1557
47	8.135851	8.137389	8.138921	8.140447	8.141969	8.143485	12	1524
48	8.144996	8.146501	8.148001	8.149497	8.150987	8.152472	11	1493
49	8.153952	8.155426	8.156896	8.158361	8.159821	8.161276	10	1462
50	8.162727	8.164172	8.165613	8.167049	8.168480	8.169906	9	1424
51	8.171328	8.172745	8.174158	8.175566	8.176969	8.178368	8	1406
52	8.179763	8.181152	8.182538	8.183919	8.185296	8.186668	7	1379
53	8.188036	8.189400	8.190760	8.192115	8.193466	8.194813	6	1353
54	8.196156	8.197494	8.198829	8.200159	8.201485	8.202808	5	1328
55	8.204126	8.205440	8.206750	8.208057	8.209359	8.210658	4	1304
56	8.211953	8.213243	8.214530	8.215814	8.217093	8.218369	3	1281
57	8.219641	8.220909	8.222174	8.223434	8.224692	8.225945	2	1259
58	8.227195	8.228442	8.229685	8.230924	8.232160	8.233392	1	1238
59	8.234621	8.235846	8.237068	8.238286	8.239501	8.240713	0	1217
	60″	50″	40″	30″	20″	10″	M	

Co-tangent 89 Degrees.

TABLE XIX.

LOGARITHMIC SINES.

Sine 1 Degree.

M	0″	10″	20″	30″	40″	50″		Diff.
0	8.241855	8.243060	8.244261	8.245459	8.246654	8.247845	59	1196
1	8.249033	8.250218	8.251400	8.252578	8.253753	8.254925	58	1177
2	8.256094	8.257260	8.258423	8.259582	8.260739	8.261892	57	1158
3	8.263042	8.264190	8.265334	8.266475	8.267613	8.268749	56	1140
4	8.269881	8.271010	8.272137	8.273260	8.274381	8.275499	55	1122
5	8.276614	8.277726	8.278835	8.279941	8.281045	8.282145	54	1105
6	8.283243	8.284339	8.285431	8.286521	8.287608	8.288692	53	1088
7	8.289773	8.290852	8.291928	8.293002	8.294073	8.295141	52	1072
8	8.296207	8.297270	8.298330	8.299388	8.300443	8.301496	51	1057
9	8.302546	8.303594	8.304639	8.305681	8.306721	8.307759	50	1041
10	8.308794	8.309827	8.310857	8.311885	8.312910	8.313933	49	1026
11	8.314954	8.315972	8.316987	8.318001	8.319012	8.320020	48	1012
12	8.321027	8.322031	8.323033	8.324032	8.325029	8.326024	47	998
13	8.327016	8.328007	8.328995	8.329980	8.330964	8.331945	46	984
14	8.332924	8.333901	8.334876	8.335848	8.336819	8.337787	45	971
15	8.338753	8.339717	8.340678	8.341638	8.342596	8.343551	44	958
16	8.344504	8.345455	8.346405	8.347352	8.348297	8.349240	43	946
17	8.350180	8.351119	8.352056	8.352991	8.353924	8.354855	42	933
18	8.355783	8.356710	8.357635	8.358558	8.359479	8.360398	41	922
19	8.361315	8.362230	8.363143	8.364054	8.364964	8.365871	40	910
20	8.366777	8.367681	8.368582	8.369482	8.370380	8.371277	39	899
21	8.372171	8.373063	8.373954	8.374843	8.375730	8.376615	38	888
22	8.377499	8.378380	8.379260	8.380138	8.381015	8.381889	37	877
23	8.382762	8.383633	8.384502	8.385370	8.386236	8.387100	36	866
24	8.387962	8.388823	8.389682	8.390539	8.391395	8.392249	35	856
25	8.393101	8.393951	8.394800	8.395647	8.396493	8.397337	34	846
26	8.398179	8.399020	8.399859	8.400696	8.401532	8.402366	33	836
27	8.403199	8.404030	8.404859	8.405687	8.406513	8.407338	32	827
28	8.408161	8.408983	8.409803	8.410621	8.411438	8.412254	31	817
29	8.413068	8.413880	8.414691	8.415500	8.416308	8.417114	30	808
30	8.417919	8.418722	8.419524	8.420324	8.421123	8.421921	29	799
31	8.422717	8.423511	8.424304	8.425096	8.425886	8.426675	28	791
32	8.427462	8.428248	8.429032	8.429815	8.430597	8.431377	27	782
33	8.432156	8.432933	8.433709	8.434484	8.435257	8.436029	26	774
34	8.436800	8.437569	8.438337	8.439103	8.439868	8.440632	25	766
35	8.441394	8.442155	8.442915	8.443674	8.444431	8.445186	24	758
36	8.445941	8.446694	8.447446	8.448196	8.448946	8.449694	23	750
37	8.450410	8.451186	8.451930	8.452672	8.453414	8.454154	22	742
38	8.454893	8.455631	8.456368	8.457103	8.457837	8.458570	21	735
39	8.459301	8.460032	8.460761	8.461489	8.462215	8.462941	20	727
40	8.463665	8.464388	8.465110	8.465830	8.466550	8.467268	19	720
41	8.467985	8.468701	8.469416	8.470129	8.470841	8.471553	18	713
42	8.472263	8.472971	8.473679	8.474386	8.475091	8.475795	17	706
43	8.476498	8.477200	8.477901	8.478601	8.479299	8.479997	16	699
44	8.480693	8.481388	8.482082	8.482775	8.483467	8.484158	15	692
45	8.484848	8.485536	8.486224	8.486910	8.487596	8.488280	14	686
46	8.488963	8.489645	8.490326	8.491006	8.491685	8.492363	13	679
47	8.493010	8.493715	8.494390	8.495064	8.495736	8.496408	12	673
48	8.497078	8.497748	8.498416	8.499084	8.499750	8.500415	11	667
49	8.501080	8.501743	8.502405	8.503067	8.503727	8.504386	10	661
50	8.505045	8.505702	8.506358	8.507014	8.507668	8.508321	9	655
51	8.508974	8.509625	8.510275	8.510925	8.511573	8.512221	8	649
52	8.512867	8.513513	8.514157	8.514801	8.515444	8.516086	7	643
53	8.516726	8·517366	8.518005	8.518643	8.519280	8.519916	6	637
54	8.520551	8.521186	8.521819	8.522451	8.523083	8.523713	5	632
55	8.524343	8.524972	8.525599	8.526226	8.526852	8.527477	4	626
56	8.528102	8.528725	8.529347	8.529969	8.530589	8.531209	3	621
57	8.531828	8.532446	8.533063	8.533679	8.534295	8.534909	2	616
58	8.535523	8.536136	8.536747	8.537358	8.537969	8.538578	1	610
59	8.539186	8.539794	8.540401	8.541007	8.541612	8.542216	0	605
	60″	50″	40″	30″	20″	10″	M	

Co-sine 88 Degrees.

TABLE XIX.

LOGARITHMIC TANGENTS.

Tangent 1 Degree.

M	0″	10″	20″	30″	40″	50″		Diff.
0	8.241921	8.243126	8.244328	8.245526	8.246721	8.247913	59	1197
1	8.249101	8.250287	8.251469	8.252648	8.253823	8.254996	58	1177
2	8.256165	8.257331	8.258494	8.359654	8.260811	8.261965	57	1158
3	8.263115	8.264263	8.265408	8.266549	8.267688	8.268824	56	1140
4	8.269956	8.271086	8.272213	8.273337	8.274458	8.275576	55	1122
5	8.276691	8.277804	8.278913	8.280020	8.281124	8.282225	54	1105
6	8.283323	8.284419	8.285512	8.286602	8.287689	8.288774	53	1089
7	8.289856	8.290935	8.292012	8.293086	8.294157	8.295226	52	1073
8	8.296292	8.297355	8.298416	8.299474	8.300530	8.301583	51	1057
9	8.302633	8.303682	8.304727	8.305770	8.306811	8.307849	50	1042
10	8.308884	8.309917	8.310948	8.311976	8.313002	8.314025	49	1027
11	8.315046	8.316065	8.317081	8.318095	8.319106	8.320115	48	1013
12	8.321122	8.322127	8.323129	8.324128	8.325126	8.326121	47	999
13	8.327114	8.328105	8.329093	8.330080	8.331064	8.332045	46	985
14	8.333025	8.334002	8.334977	8.335950	8.336921	8.337890	45	972
15	8.338856	8.339821	8.340783	8.341743	8.342701	8.343657	44	959
16	8.344610	8.345562	8.346512	8.347459	8.348405	8.349348	43	946
17	8.350289	8.351229	8.352166	8.353101	8.354035	8.354966	42	934
18	8.355895	8.356823	8.357748	8.358671	8.359593	8.360512	41	922
19	8.361430	8.362345	8.363259	8.364171	8.365080	8.365988	40	911
20	8.366894	8.367799	8.368701	8.369601	8.370500	8.371397	39	899
21	8.372291	8.373184	8.374076	8.374965	8.375853	8.376738	38	888
22	8.377622	8.378504	8.379385	8.380263	8.381140	8.382015	37	878
23	8.382889	8.383760	8.384630	8.385498	8.386364	8.387229	36	867
24	8.388092	8.388953	8.389812	8.390670	8.391526	8.392381	35	857
25	8.393234	8.394085	8.394934	8.395782	8.396628	8.397472	34	847
26	8.398315	8.399156	8.399996	8.400834	8.401670	8.402505	33	837
27	8.403338	8.404170	8.405000	8.405828	8.406655	8.407480	32	828
28	8.408304	8.409126	8.409946	8.410765	8.411583	8.412399	31	818
29	8.413213	8.414026	8.414837	8.415647	8.416456	8.417262	30	809
30	8.418068	8.418872	8.419674	8.420475	8.421274	8.422072	29	800
31	8.422869	8.423664	8.424458	8.425250	8.426040	8.426830	28	791
32	8.427618	8.428404	8.429189	8.429973	8.430755	8.431536	27	783
33	8.432315	8.433093	8.433870	8.434645	8.435419	8.436191	26	775
34	8.436962	8.437732	8.438500	8.439267	8.440033	8.440797	25	766
35	8.441560	8.442322	8.443082	8.443841	8.444599	8.445355	24	758
36	8.446110	8.446864	8.447616	8.448367	8.449117	8.449866	23	750
37	8.450613	8.451359	8.452104	8.452847	8.453589	8.454330	22	743
38	8.455070	8.455808	8.456545	8.457281	8.458016	8.458749	21	735
39	8.459481	8.460212	8.460942	8.461670	8.462398	8.463124	20	728
40	8.463849	8.464572	8.465295	8.466016	8.466736	8.467455	19	721
41	8.468172	8.468889	8.469604	8.470318	8.471031	8.471743	18	714
42	8.472454	8.473163	8.473871	8.474579	8.475285	8.475990	17	707
43	8.476693	8.477396	8.478597	8.478798	8.479497	8.480195	16	700
44	8.480892	8.481588	8.482283	8.482976	8.483669	8.484360	15	693
45	8.485050	8.485740	8.486428	8.487115	8.487801	8.488486	14	687
46	8.489170	8.489852	8.490534	8.491215	8.491894	8.492573	13	680
47	8.493250	8.493927	8.494602	8.495276	8.495949	8.496622	12	674
48	8.497293	8.497963	8.498632	8.499300	8.499967	8.500633	11	668
49	8.501298	8.501962	8.502625	8.503287	8.503948	8.504608	10	661
50	8.505267	8.505925	8.506582	8.507238	8.507893	8.508547	9	656
51	8.509200	8.509852	8.510503	8.511153	8.511802	8.512451	8	650
52	8.513098	8.513744	8.514389	8.515034	8.515677	8.516319	7	644
53	8.516961	8.517602	8.518241	8.518880	8.519517	8.520154	6	638
54	8.520790	8.521425	8.522059	8.522692	8.523324	8.523956	5	633
55	8.524586	8.525215	8.525844	8.526472	8.527098	8.527724	4	627
56	8.528349	8.528973	8.529596	8.530218	8.530840	8.531460	3	622
57	8.532080	8.532698	8.533316	8.533933	8.534549	8.535164	2	616
58	8.535779	8.536392	8.537005	8.537616	8.538227	8.538837	1	611
59	8.539447	8.540055	8.540662	8.541269	8.541875	8.542480	0	606
	60″	50″	40″	30″	20″	10″	M	

Co-tangent 88 Degrees.

TABLE XIX.

LOGARITHMIC SINES, TANGENTS, AND SECANTS.

0 Degree.

M	Sine.	Diff.	Co-sine.	D.	Tang.	Diff.	Co-tang.	Secant.	Co-sec.	M
0	0.000000		10.000000	00	0.000000		Infinite.	10.000000	Infinite.	60
1	6.463726	501717	10.000000	00	6.463726	501717	13.536274	10.000000	13.536274	59
2	6.764756	293485	10.000000	00	6.764756	293485	13.235244	10.000000	13.235244	58
3	6.940847	208231	10.000000	00	6.940847	208231	13.059153	10.000000	13.059153	57
4	7.065786	161517	10.000000	00	7.065786	161517	12.934214	10.000000	12.931214	56
5	7.162696	131968	10.000000	00	7.162696	131969	12.837304	10.000000	12.837304	55
6	7.241877	111578	9.999999	00	7.241878	111578	12.758122	10.000001	12.758123	54
7	7.308824	96653	9.999999	00	7.308825	96653	12.691175	10.000001	12.691176	53
8	7.366816	85254	9.999999	00	7.366817	85254	12.633183	10.000001	12.633184	52
9	7.417968	76262	9.999999	01	7.417970	76263	12.582030	10.000001	12.582032	51
10	7.463726	68988	9.999998	00	7.463727	68988	12.536273	10.000002	12.536274	50
11	7.505118	62981	9.999998	01	7.505120	62981	12.494880	10.000002	12.494882	49
12	7.542906	57936	9.999997	00	7.542909	57937	12.457091	10.000003	12.457094	48
13	7.577668	53641	9.999997	01	7.577672	53642	12.422328	10.000003	12.422332	47
14	7.609853	49938	9.999996	00	7.609857	49939	12.390143	10.000004	12.390147	46
15	7.639816	46714	9.999996	01	7.639820	46715	12.360180	10.000004	12.360184	45
16	7.667845	43881	9.999995	00	7.667849	43882	12.332151	10.000005	12.332155	44
17	7.694173	41372	9.999995	01	7.694179	41373	12.305821	10.000005	12.305827	43
18	7.718997	39135	9.999994	01	7.719003	39136	12.280997	10.000006	12.281003	42
19	7.742478	37127	9.999993	00	7.742484	37128	12.257516	10.000007	12.257522	41
20	7.764754	35315	9.999993	01	7.764761	35313	12.235239	10.000007	12.235246	40
21	7.785943	33672	9.999992	01	7.785951	33673	12.214049	10.000008	12.214057	39
22	7.806146	32175	9.999991	01	7.806155	32176	12.193845	10.000009	12.193854	38
23	7.825451	30805	9.999990	01	7.825460	30807	12.174540	10.000010	12.174549	37
24	7.843934	29547	9.999989	01	7.843944	29549	12.156056	10.000011	12.156066	36
25	7.861662	28388	9.999989	00	7.861674	28390	12.138326	10.000011	12.138338	35
26	7.878695	27317	9.999988	01	7.878708	27318	12.121292	10.000012	12.121305	34
27	7.895085	26323	9.999987	01	7.895099	26325	12.104901	10.000013	12.104915	33
28	7.910879	25399	9.999986	01	7.910894	25401	12.089106	10.000014	12.089121	32
29	7.926119	24538	9.999985	01	7.926134	24540	12.073866	10.000015	12.073881	31
30	7.940842	23733	9.999983	03	7.940858	23735	12.059142	10.000017	12.059158	30
31	7.955082	22980	9.999982	01	7.955100	22982	12.044900	10.000018	12.044918	29
32	7.968870	22273	9.999981	01	7.698889	22275	12.031111	10.000019	12.031130	28
33	7.982233	21608	9.999980	01	7.982253	21610	12.017747	10.000020	12.017767	27
34	7.995198	20981	9.999979	03	7.995219	20983	12.004781	10.000021	12.004802	26
35	8.007787	20390	9.999977	01	8.007809	20392	11.992191	10.000023	11.992213	25
36	8.020021	19831	9.999976	01	8.020045	19833	11.979955	10.000024	11.979979	24
37	8.031919	19302	9.999975	01	8.031945	19305	11.968055	10.000025	11.968081	23
38	8.043501	18801	9.999973	03	8.043527	18803	11.956473	10.000027	11.956499	22
39	8.054781	18325	9.999972	01	8.054809	18327	11.945191	10.000028	11.945219	21
40	8.065776	17872	9.999971	03	8.065806	17875	11.934194	10.000029	11.934224	20
41	8.076500	17441	9.999969	01	8.076531	17444	11.923469	10.000031	11.923500	19
42	8.086965	17031	9.999968	03	8.086997	17034	11.913003	10.000032	11.913035	18
43	8.097183	16639	9.999966	03	8.097217	16642	11.902783	10.000034	11.902817	17
44	8.107167	16265	9.999964	01	8.107202	16268	11.892798	10.000036	11.892833	16
45	8.116926	15908	9.999963	03	8.116963	15911	11.883037	10.000037	11.883074	15
46	8.126471	15566	9.999961	03	8.126510	15568	11.873490	10.000039	11.873529	14
47	8.135810	15238	9.999959	01	8.135851	15241	11.864149	10.000041	11.864190	13
48	8.144953	14924	9.999958	03	8.144996	14927	11.855004	10.000042	11.855047	12
49	8.153907	14622	9.999956	03	8.153952	14625	11.846048	10.000044	11.846093	11
50	8.162681	14333	9.999954	03	8.162727	14336	11.837273	10.000046	11.837319	10
51	8.171280	14054	9.999952	03	8.171328	14057	11.828672	10.000048	11.828720	9
52	8.179713	13786	9.999950	03	8.179763	13790	11.820237	10.000050	11.820287	8
53	8.187985	13529	9.999948	03	8.188036	13532	11.811964	10.000052	11.812015	7
54	8.196102	13280	9.999946	03	8.196156	13284	11.803844	10.000054	11.803898	6
55	8.204070	13041	9.999944	03	8.204126	13044	11.795874	10.000056	11.795930	5
56	8.211895	12810	9.999942	03	8.211953	12814	11.788047	10.000058	11.788105	4
57	8.219581	12587	9.999940	03	8.219641	12591	11.780359	10.000060	11.780419	3
58	8.227134	12372	9.999938	03	8.227195	12376	11.772805	10.000062	11.772866	2
59	8.234557	12164	9.999936	03	8.234621	12168	11.765379	10.000064	11.765443	1
60	8.241855		9.999934		8.341922		11.758078	10.000066	11.758145	0
M	Co-sine.		Sine.		Co-tang.		Tang.	Co-sec.	Secant.	M

89 Degrees.

TABLE XIX.

LOGARITHMIC SINES, TANGENTS, AND SECANTS.

1 Degree.

M	Sine.	Diff.	Co-sine.	D.	Tang.	Diff.	Co-tang.	Secant.	Co-sec.	M
0	8.241855	11963	9.999934	03	8.241921	11967	11.758079	10.000066	11.758145	60
1	8.249033	11768	9.999932	05	8.249102	11772	11.750898	10.000068	11.750967	59
2	8.256094	11580	9.999929	03	8.256165	11584	11.743835	10.000071	11.743906	58
3	8.263042	11397	9.999927	03	8.263115	11402	11.736885	10.000073	11.736958	57
4	8.269881	11221	9.999925	05	8.269956	11225	11.730044	10.000075	11.730119	56
5	8.276614	11050	9.999922	03	8.276691	11054	11.723309	10.000078	11.723386	55
6	8.283243	10883	9.999920	05	8.283323	10887	11.716677	10.000080	11.716757	54
7	8.289773	10722	9.999918	03	8.289856	10726	11.710144	10.000082	11.710227	53
8	8.296207	10565	9.999915	05	8.296292	10570	11.703708	10.000085	11.703793	52
9	8.302546	10413	9.999913	03	8.302634	10418	11.697366	10.000087	11.697454	51
10	8.308794	10266	9.999910	05	8.308884	10270	11.691116	10.000090	11.691206	50
11	8.314954	10122	9.999907	03	8.315046	10126	11.684954	10.000093	11.685046	49
12	8.321027	9982	9.999905	05	8.321122	9987	11.678878	10.000095	11.678973	48
13	8.327016	9847	9.999902	05	8.327114	9851	11.672886	10.000098	11.672984	47
14	8.332924	9714	9.999899	03	8.333025	9719	11.666975	10.000101	11.667076	46
15	8.338753	9586	9.999897	05	8.338856	9590	11.661144	10.000103	11.661247	45
16	8.344504	9460	9.999894	05	8.344610	9465	11.655390	10.000106	11.655496	44
17	8.350181	9338	9.999891	05	8.350289	9343	11.649711	10.000109	11.649819	43
18	8.355783	9219	9.999888	05	8.355895	9224	11.644105	10.000112	11.644217	42
19	8.361315	9103	9.999885	05	8.361430	9108	11.638570	10.000115	11.638685	41
20	8.366777	8990	9.999882	05	8.366895	8995	11.663105	10.000118	11.633223	40
21	8.372171	8880	9.999879	05	8.372292	8885	11.627708	10.000121	11.627829	39
22	8.377499	8772	9.999876	05	8.377622	8777	11.622378	10.000124	11.622501	38
23	8.382762	8667	9.999873	05	8.382889	8672	11.617111	10.000127	11.617238	37
24	8.387962	8564	9.999870	05	8.388092	8570	11.611908	10.000130	11.612038	36
25	8.393101	8464	9.999867	05	8.393234	8470	11.606766	10.000133	11.606899	35
26	8.398179	8366	9.999864	05	8.398315	8371	11.601685	10.000136	11.601821	34
27	8.403199	8271	9.999861	05	8.403338	8276	11.596662	10.000139	11.596801	33
28	8.408161	8177	9.999858	07	8.408304	8182	11.591696	10.000142	11.591839	32
29	8.413068	8086	9.999854	05	8.413213	8091	11.586787	10.000146	11.586932	31
30	8.417919	7996	9.999851	05	8.418068	8002	11.581932	10.000149	11.582081	30
31	8.422717	7909	9.999848	07	8.422869	7914	11.577131	10.000152	11.577283	29
32	8.427462	7823	9.999844	05	8.427618	7829	11.572382	10.000156	11.572538	28
33	8.432156	7740	9.999841	05	8.432315	7745	11.567685	10.000159	11.567844	27
34	8.436800	7657	9.999838	07	8.436962	7663	11.563038	10.000162	11.563200	26
35	8.441394	7577	9.999834	05	8.441560	7583	11.558440	10.000166	11.558606	25
36	8.445941	7499	9.999831	07	8.446110	7505	11.553890	10.000169	11.554059	24
37	8.450440	7422	9.999827	07	8.450613	7428	11.549387	10.000173	11.549560	23
38	8.454893	7346	9.999824	05	8.455070	7352	11.544930	10.000176	11.545107	22
39	8.459301	7273	9.999820	07	8.459481	7279	11.540519	10.000180	11.540699	21
40	8.463665	7200	9.999816	07	8.463849	7206	11.536151	10.000184	11.536335	20
41	8.467985	7129	9.999813	05	8.468172	7135	11.531828	10.000187	11.532015	19
42	8.472263	7060	9.999809	07	8.472454	7066	11.527546	10.000191	11.527737	18
43	8.476498	6991	9.999805	07	8.476693	6998	11.523307	10.000195	11.523502	17
44	8.480693	6924	9.999801	07	8.480892	6931	11.519108	10.000199	11.519307	16
45	8.484848	6859	9.999797	07	8.485050	6865	11.514950	10.000203	11.515152	15
46	8.488963	6794	9.999794	05	8.489170	6801	11.510830	10.000206	11.511037	14
47	8.493040	6731	9.999790	07	8.493250	6738	11.506750	10.000210	11.506960	13
48	8.497078	6669	9.999786	07	8.497293	6676	11.502707	10.000214	11.502922	12
49	8.501080	6608	9.999782	07	8.501298	6615	11.598702	10.000218	11.498920	11
50	8.505045	6548	9.999778	07	8.505267	6555	11.594733	10.000222	11.494955	10
51	8.508974	6489	9.999774	08	8.509200	6496	11.490800	10.000226	11.491026	9
52	8.512867	6432	9.999769	07	8.513098	6439	11.486902	10.000231	11.487133	8
53	8.516726	6375	9.999765	07	8.516961	6382	11.483039	10.000235	11.483274	7
54	8.520551	6319	9.999761	07	8.520790	6326	11.479210	10.000239	11.479449	6
55	8.524343	6264	9.999757	07	8.524586	6272	11.475414	10.000243	11.475657	5
56	8.528102	6211	9.999753	08	8.528349	6218	11.471651	10.000247	11.471898	4
57	8.531828	6158	9.999748	07	8.532080	6165	11.467920	10.000252	11.468172	3
58	8.535523	6106	9.999744	07	8.535779	6113	11.464221	10.000256	11.464477	2
59	8.539186	6055	9.999740	08	8.539147	6062	11.460553	10.000260	11.460814	1
60	8.542819		9.999735		8.543084		11.456916	10.000265	11.457181	0
M	Co-sine.		Sine.		Co-tang.		Tang.	Co-sec.	Secant.	M

88 Degrees.

TABLE XIX.

LOGARITHMIC SINES, TANGENTS, AND SECANTS.

2 Degrees.

M	Sine.	Diff.	Co-sine.	D.	Tang.	Diff.	Co-tang.	Secant.	Co-sec.	M
0	8.542819	6004	9.999735	07	8.543084	6012	11.456916	10.000265	11.457181	60
1	8.546422	5955	9.999731	07	8.546691	5962	11.453309	10.000269	11.453578	59
2	8.549995	5906	9.999726	08	8.550268	5914	11.449732	10.000274	11.450005	58
3	8.553539	5858	9.999722	08	8.553817	5866	11.446183	10.000278	11.446461	57
4	8.557054	5811	9.999717	07	8.557336	5819	11.442664	10.000283	11.442946	56
5	8.560540	5765	9.999713	08	8.560828	5773	11.439172	10.000287	11.439460	55
6	8.563999	5719	9.999708	07	8.564291	5727	11.435709	10.000292	11.436001	54
7	8.567431	5674	9.999704	08	8.567727	5682	11.432273	10.000296	11.432569	53
8	8.570836	5630	9.999699	08	8.571137	5638	11.428863	10.000301	11.429164	52
9	8.574214	5587	9.999694	08	8.574520	5595	11.425480	10.000306	11.425786	51
10	8.577566	5544	9.999689	07	8.577877	5552	11.322123	10.000311	11.422434	50
11	8.580892	5502	9.999685	08	8.581208	5510	11.418792	10.000315	11.419108	49
12	8.584193	5460	9.999680	08	8.584514	5468	11.415486	10.000320	11.415807	48
13	8.587469	5419	9.999675	08	8.587795	5427	11.412205	10.000325	11.412531	47
14	8.590721	5379	9.999670	08	8.591051	5387	11.408949	10.000330	11.409279	46
15	8.593948	5339	9.999665	08	8.594283	5347	11.405717	10.000335	11.406052	45
16	8.597152	5300	9.999660	08	8.597492	5308	11.402508	10.000340	11.402848	44
17	8.600332	5261	9.999655	08	8.600677	5270	11.399323	10.000345	11.399668	43
18	8.603489	5223	9.999650	08	8.603839	5232	11.396161	10.000350	11.396511	42
19	8.606623	5186	9.999645	08	8.606978	5194	11.393022	10.000355	11.393377	41
20	8.609734	5149	9.999640	08	8.610094	5158	11.389906	10.000360	11.390266	40
21	8.612823	5112	9.999635	10	8.613189	5121	11.386811	10.000365	11.387177	39
22	8.615891	5076	9 999629	08	8.616262	5085	11.383738	10.000371	11.384109	38
23	8.618937	5041	9.999624	08	8.619313	5050	11.380687	10.000376	11.381062	37
24	8.621962	5006	9.999619	08	8.622343	5015	11.377657	10.000381	11.378038	36
25	8.624965	4972	9.999614	10	8.625352	4981	11.374648	10.000386	11.375035	35
26	8.627948	4938	9.999608	08	8.628340	4947	11.371660	10.000392	11.372052	34
27	8.630911	4904	9.999603	10	8.631308	4913	11.368692	10.000397	11.369089	33
28	8.633854	4871	9.999597	08	8.634256	4880	11.365744	10.000403	11.366146	32
29	8.636776	4839	9.999592	08	8.637184	4848	11.362816	10.000408	11.363224	31
30	8.639680	4806	9.999586	10	8.640093	4816	11.359907	10.000414	11.360320	30
31	8.642563	4775	9.999581	10	8.642982	4784	11.357017	10.000419	11.357437	29
32	8.645428	4745	9.999575	08	8.645853	4753	11.354147	10.000425	11.354572	28
33	8.648274	4712	9.999570	10	8.648704	4722	11.351296	10.000430	11.351726	27
34	8.651102	4682	9.999564	10	8.651537	4691	11.348463	10.000436	11.348898	26
35	8.653911	4652	9.999558	08	8.654352	4661	11.445648	10.000442	11.346089	25
36	8.656702	4622	9.999553	10	8.657149	4631	11.342851	10.000447	11.343298	24
37	8.659475	4592	9.999547	10	8.659928	4602	11.340072	10.000453	11.340525	23
38	8.662230	4563	9 999541	10	8.662689	4573	11.337311	10.000459	11.337770	22
39	8.664968	4535	9.999535	10	8.665433	4544	11.334567	10.000465	11.335032	21
40	8.667689	4506	9.999529	08	8.668160	4516	11.331840	10.000471	11.332311	20
41	8.670393	4479	9.999524	10	8.670870	4488	11.329130	10.000476	11.329607	19
42	8.673080	4451	9.999518	10	8.673563	4461	11.326437	10.000482	11.326920	18
43	8.675751	4424	9.999512	10	8.676239	4434	11.323761	10.000488	11.324249	17
44	8.678405	4397	9.999506	10	8.678900	4407	11.321100	10.000494	11.321595	16
45	8.681043	4370	9.999500	10	8.681544	4380	11.318456	10.000500	11.318957	15
46	8.683665	4344	9.999493	12	8.684172	4354	11.315828	10.000507	11.316335	14
47	8.686272	4318	9.999487	10	8.686784	4328	11.313216	10.000513	11.313728	13
48	8.688863	4292	9.999481	10	8.689381	4303	11.310619	10.000519	11.311137	12
49	8.691438	4267	9.999475	10	8.691963	4277	11.308037	10.000525	11.308562	11
50	8.693998	4242	9.999469	12	8.694529	4252	11.305471	10.000531	11.306002	10
51	8.696543	4217	9.999463	10	8.697081	4228	11.302919	10.000537	11.303457	9
52	8.699073	4192	9.999456	10	8.699617	4203	11.300383	10.000544	11.300927	8
53	8.701589	4168	9.999450	10	8.702139	4179	11.297861	10.000550	11.298411	7
54	8.704090	4144	9.999443	12	8.704646	4155	11.295354	10.000557	11.295910	6
55	8.706577	4121	9.999437	10	8.707140	4132	11.292860	10.000563	11.293423	5
56	8.709049	4097	9.999431	12	8.709618	4108	11.290382	10.000569	11.290951	4
57	8.711507	4074	9.999424	10	8.712083	4085	11.287917	10.000576	11.288493	3
58	8.713952	4052	9.999418	12	8.714534	4062	11.285466	10.000582	11.286048	2
59	8.716383	4029	9.999411	12	8.716972	4040	11.283028	10.000589	11.283617	1
60	8.718800		9.999404		8.719396		11.280603	10.000596	11.281200	0
M	Co-sine.		Sine.		Co-tang.		Tang.	Co-sec.	Secant.	M

87 Degrees.

TABLE XIX.

LOGARITHMIC SINES, TANGENTS, AND SECANTS.

3 Degrees.

M	Sine.	Diff.	Co-sine.	D.	Tang.	Diff.	Co-tang.	Secant.	Co-sec.	M
0	8.718800	4006	9.999404	10	8.719396	4017	11.280604	10.000596	11.281200	60
1	8.721204	3984	9.999398	12	8.721806	3995	11.278194	10.000602	11.278796	59
2	8.723595	3962	9.999391	12	8.724204	3974	11.275796	10.000609	11.276405	58
3	8.725972	3941	9.999384	10	8.726588	3952	11.273412	10.000616	11.274028	57
4	8.728337	3919	9.999378	12	8.728959	3931	11.271041	10.000622	11.271663	56
5	8.730688	3898	9.999371	12	8.731317	3909	11.268683	10.000629	11.269312	55
6	8.733027	3877	9.999364	12	8.733663	3889	11.266337	10.000636	11.266973	54
7	8.735354	3857	9.999357	12	8.735996	3868	11.264004	10.000643	11.264646	53
8	8.737667	3836	9.999350	12	8.738317	3848	11.261683	10.000650	11.262333	52
9	8.739969	3816	9.999343	12	8.740626	3827	11.259374	10.000657	11.260031	51
10	8.742259	3796	9.999336	12	8.742922	3807	11.257078	10.000664	11.257741	50
11	8.744536	3776	9.999329	12	8.745207	3787	11.254793	10.000671	11.255464	49
12	8.746802	3756	9.999322	12	8.747479	3768	11.252521	10.000678	11.253198	48
13	8.749055	3737	9.999315	12	8.749740	3749	11.250260	10.000685	11.250945	47
14	8.751297	3717	9.999308	12	8.751989	3729	11.248011	10.000692	11.248703	46
15	8.753528	3698	9.999301	12	8.754227	3710	11.245773	10.000699	11.246472	45
16	8.755747	3679	9.999294	13	8.756453	3692	11.243547	10.000706	11.244253	44
17	8.757955	3661	9.999287	12	8.758668	3673	11.241332	10.000713	11.242045	43
18	8.760151	3642	9.999279	12	8.760872	3655	11.239128	10.000721	11.239849	42
19	8.762337	3624	9.999272	12	8.763065	3636	11.236935	10.000728	11.237663	41
20	8.764511	3606	9.999265	13	8.765246	3618	11.234754	10.000735	11.235489	40
21	8.766675	3588	9.999257	12	8.767417	3600	11.232583	10.000743	11.233325	39
22	8.768828	3570	9.999250	13	8.769578	3583	11.230422	10.000750	11.231172	38
23	8.770970	3553	9.999242	12	8.771727	3565	11.228273	10.000758	11.229030	37
24	8.773101	3535	9.999235	13	8.773866	3548	11.226134	10.000765	11.226899	36
25	8.775223	3518	9.999227	12	8.775996	3531	11.224005	10.000773	11.224777	35
26	8.777333	3501	9.999220	13	8.778114	3514	11.221886	10.000780	11.222667	34
27	8.779434	3484	9.999212	12	8.780222	3497	11.219778	10.000788	11.220566	33
28	8.781524	3467	9.999205	13	8.782320	3480	11.217680	16.000795	11.218476	32
29	8.783605	3451	9.999197	13	8.784408	3464	11.215592	10.000803	11.216395	31
30	8.785675	3434	9.999189	13	8.786486	3447	11.213514	10.000811	11.214325	30
31	8.787736	3418	9.999181	12	8.788554	3431	11.211446	10.000819	11.212264	29
32	8.789787	3402	9.999174	13	8.790613	3415	11.209387	10.000826	11.210213	28
33	8.791828	3386	9.999166	13	8.792662	3399	11.207338	10.000834	11.208172	27
34	8.793859	3370	9.999158	13	8.794701	3383	11.205299	10.000842	11.206141	26
35	8.795881	3354	9.999150	13	8.796731	3368	11.203269	10.000850	11.204119	25
36	8.797894	3339	9.999142	13	8.798752	3352	11.201248	10.000858	11.202106	24
37	8.799897	3323	9.999134	13	8.800763	3337	11.199237	10.000866	11.200103	23
38	8.801892	3308	9.999126	13	8.802765	3322	11.197235	10.000874	11.198108	22
39	8.803876	3293	9.999118	13	8.804758	3306	11.195242	10.000882	11.196124	21
40	8.805852	3278	9.999110	13	8.806742	3292	11.193258	10.000890	11.194148	20
41	8.807819	3263	9.999102	13	8.808717	3277	11.191283	10.000898	11.192181	19
42	8.809777	3249	9.999094	13	8.810683	3262	11.189317	10.000906	11.190223	18
43	8.811726	3234	9.999086	15	8.812641	3248	11.187359	10.000914	11.188274	17
44	8.813667	3219	9.999077	13	8.814589	3233	11.185411	10.000923	11.186333	16
45	8.815599	3205	9.999069	13	8.816529	3219	11.183471	10.000931	11.184401	15
46	8.817522	3191	9.999061	15	8.818461	3205	11.181539	10.000939	11.182478	14
47	8.819436	3177	9.999053	13	8.820384	3191	11.179616	10.000947	11.180564	13
48	8.821343	3163	9.999044	13	8.822298	3177	11.177702	10.000956	11.178657	12
49	8.823240	3149	9.999036	15	8.824205	3163	11.175795	10.000964	11.176760	11
50	8.825130	3135	9.999027	13	8.826103	3150	11.173897	10.000973	11.174870	10
51	8.827011	3122	9.999019	15	8.827992	3136	11.172008	10.000981	11.172989	9
52	8.828884	3108	9.999010	13	8.829874	3123	11.170126	10.000990	11.171116	8
53	8.830749	3095	9.999002	15	8.831748	3109	11.168252	10.000998	11.169251	7
54	8.832607	3082	9.998993	15	8.833613	3096	11.166387	10.001007	11.167393	6
55	8.834456	3069	9.998984	13	8.835471	3083	11.164529	10.001016	11.165544	5
56	8.836297	3056	9.998976	15	8.837321	3070	11.162679	10.001024	11.163703	4
57	8.838130	3043	9.998967	15	8.839163	3057	11.160837	10.001033	11.161870	3
58	8.839956	3030	9.998958	13	8.840998	3045	11.159002	10.001042	11.160044	2
59	8.841774	3017	9.998950	15	8.842825	3032	11.157175	10.001050	11.158226	1
60	8.843585		9.998941		8.844644		11.155356	10.001059	11.156415	0
M	Co-sine.		Sine.		Co-tang.		Tang.	Co-sec.	Secant.	M

86 Degrees.

TABLE XIX.

LOGARITHMIC SINES, TANGENTS, AND SECANTS.

4 Degrees.

M	Sine.	Diff.	Co-sine.	D.	Tang.	Diff.	Co-tang.	Secant.	Co-sec.	M
0	8.843585	3005	9.998941	15	8.844644	3019	11.155356	10.001059	11.156415	60
1	8.845387	2992	9.998932	15	8.846455	3007	11.153545	10.001068	11.154613	59
2	8.847183	2980	9.998923	15	8.848260	2995	11.151740	10.001077	11.152817	58
3	8.848971	2967	9.998914	15	8.850057	2982	11.149943	10.001086	11.151029	57
4	8.850751	2955	9.998905	15	8.851846	2970	11.148154	10.001095	11.149249	56
5	8.852525	2943	9.998896	15	8.853628	2958	11.146372	10.001104	11.147475	55
6	8.854291	2931	9.998887	15	8.855403	2946	11.144597	10.001113	11.145709	54
7	8.856049	2919	9.998878	15	8.857171	2935	11.142829	10.001122	11.143951	53
8	8.857801	2908	9.998869	15	8.858932	2923	11.141068	10.001131	11.142199	52
9	8.859546	2896	9.998860	15	8.860686	2911	11.139314	10.001140	11.140454	51
10	8.861283	2884	9.998851	17	8.862433	2900	11.137567	10.001149	11.138717	50
11	8.863014	2873	9.998841	15	8.864173	2888	11.135827	10.001159	11.136986	49
12	8.864738	2861	9.998832	15	8.865906	2877	11.134094	10.001168	11.135262	48
13	8.866455	2850	9.998823	17	8.867632	2866	11.132368	10.001177	11.133545	47
14	8.868165	2839	9.998813	15	8.869351	2854	11.130649	10.001187	11.131835	46
15	8.869868	2828	9.998804	15	8.871064	2843	11.128936	10.001196	11.130132	45
16	8.871565	2817	9.998795	17	8.872770	2832	11.127230	10.001205	11.128435	44
17	8.873255	2806	9.998785	15	8.874469	2821	11.125531	10.001215	11.126745	43
18	8.874938	2895	9.998776	17	8.876162	2811	11.123838	10.001224	11.125062	42
19	8.876615	2784	9.998766	15	8.877849	2800	11.122151	10.001234	11.123385	41
20	8.878285	2773	9.998757	17	8.879529	2789	11.120471	10.001243	11.121715	40
21	8.879949	2763	9.998747	17	8.881202	2779	11.118798	10.001253	11.120051	39
22	8.881607	2752	9.998738	15	8.882869	2768	11.117131	10.001262	11.118393	38
23	8.883258	2742	9.998728	17	8.884530	2758	11.115470	10.001272	11.116742	37
24	8.884903	2731	9.998718	17	8.886185	2747	11.113815	10.001282	11.115097	36
25	8.886542	2721	9.998708	15	8.887833	2737	11.112167	10.001292	11.113458	35
26	8.888174	2711	9.998699	17	8.889476	2727	11.110524	10.001301	11.111826	34
27	8.889801	2700	9.998689	17	8.891112	2717	11.108888	10.001311	11.110199	33
28	8.891421	2690	9.998679	17	8.892742	2707	11.107258	10.001321	11.108579	32
29	8.893035	2680	9.998669	17	8.894366	2697	11.105634	10.001331	11.106965	31
30	8.894643	2670	9.998659	17	8.895984	2687	11.104016	10.001341	11.105357	30
31	8.896246	2660	9.998649	17	8.897596	2677	11.102404	10.001351	11.103754	29
32	8.897842	2651	9.998639	17	8.899203	2667	11.100797	10.001361	11.102158	28
33	8.899432	2641	9.998629	17	8.900803	2658	11.099197	10.001371	11.100568	27
34	8.901017	2631	9.998619	17	8.902398	2648	11.097602	10.001381	11.098983	26
35	8.902596	2622	9.998609	17	8.903987	2638	11.096013	10.001391	11.097404	25
36	8.904169	2612	9.998599	17	8.905570	2629	11.094430	10.001401	11.095831	24
37	8.905736	2603	9.998589	18	8.907147	2620	11.092853	10.001411	11.094264	23
38	8.907297	2593	9.998578	17	8.908719	2610	11.091281	10.001422	11.092703	22
39	8.908853	2584	9.998568	17	8.910285	2601	11.089715	10.001432	11.091147	21
40	8.910404	2575	9.998558	17	8.911846	2592	11.088154	10.001442	11.089596	20
41	8.911949	2566	9.998548	18	8.913401	2583	11.086599	10.001452	11.088051	19
42	8.913488	2556	9.998537	17	8.914951	2574	11.085049	10.001463	11.086512	18
43	8.915022	2547	9.998527	18	8.916495	2565	11.083505	10.001473	11.084978	17
44	8.916550	2538	9.998516	17	8.918034	2556	11.081966	10.001484	11.083450	16
45	8.918073	2529	9.998506	18	8.919568	2547	11.080432	10.001494	11.081927	15
46	8.919591	2520	9.998495	17	8.921096	2538	11.078904	10.001505	11.080409	14
47	8.921103	2512	9.998485	18	8.922619	2530	11.077381	10.001515	11.078897	13
48	8.922610	2503	9.998474	17	8.924136	2521	11.075864	10.001526	11.077390	12
49	8.924112	2494	9.998464	18	8.925649	2512	11.074351	10.001536	11.075888	11
50	8.925609	2486	9.998453	18	8.927156	2503	11.072844	10.001547	11.074391	10
51	8.927100	2477	9.998442	18	8.928658	2495	11.071342	10.001558	11.072900	9
52	8.928587	2469	9.998431	17	8.930155	2486	11.069845	10.001569	11.071413	8
53	8.930068	2460	9.998421	18	8.931647	2478	11.068353	10.001579	11.069932	7
54	8.931544	2452	9.998410	18	8.933134	2470	11.066866	10.001590	11.068456	6
55	8.933015	2443	9.998399	18	8.934616	2461	11.065384	10.001601	11.066985	5
56	8.934481	2435	9.998388	18	8.936093	2453	11.063907	10.001612	11.065519	4
57	8.935942	2427	9.998377	18	8.937565	2445	11.062435	10.001623	11.064058	3
58	8.937398	2419	9.998366	18	8.939032	2437	11.060968	10.001634	11.062602	2
59	8.938850	2411	9.998355	18	8.940494	2429	11.059506	10.001645	11.061150	1
60	8.940296		9.998344		8.941952		11.058048	10.001656	11.059704	0
M	Co-sine.		Sine.		Co-tang.		Tang.	Co-sec.	Secant.	M

85 Degrees.

TABLE XIX.

LOGARITHMIC SINES, TANGENTS, AND SECANTS.

5 Degrees.

M	Sine.	Diff.	Co-sine.	D.	Tang.	Diff.	Co-tang.	Secant.	Co-sec.	M
0	8.940296	2403	9.998344	18	8.941952	2421	11.058048	10.001656	11.059704	60
1	8.941738	2394	9.998333	18	8.943404	2413	11.056596	10.001667	11.058262	59
2	8.943174	2387	9.998322	18	8.944852	2405	11.055148	10.001678	11.056826	58
3	8.944606	2379	9.998311	18	8.946295	2397	11.053705	10.001689	11.055394	57
4	8.946034	2371	9.998300	18	8.947734	2390	11.052266	10.001700	11.053966	56
5	8.947456	2363	9.998289	20	8.949168	2382	11.050832	10.001711	11.052544	55
6	8.948874	2355	9.998277	18	8.950597	2374	11.049403	10.001723	11.051126	54
7	8.950287	2348	9.998266	18	8.952021	2366	11.047979	10.001734	11.049713	53
8	8.951696	2340	9.998255	20	8.953441	2359	11.046559	10.001745	11.048304	52
9	8.953100	2332	9.998243	18	8.954856	2351	11.045144	10.001757	11.046900	51
10	8.954499	2325	9.998232	20	8.956267	2344	11.043733	10.001768	11.045501	50
11	8.955894	2317	9.998220	18	8.957674	2336	11.042326	10.001780	11.044106	49
12	8.957284	2310	9.998209	20	8.959075	2329	11.040925	10.001791	11.042716	48
13	8.958670	2302	9.998197	18	8.960473	2322	11.039527	10.001803	11.041330	47
14	8.960052	2295	9.998186	20	8.961866	2314	11.038134	10.001814	11.039948	46
15	8.961429	2288	9.998174	18	8.963255	2307	11.036745	10.001826	11.038571	45
16	8.962801	2280	9.998163	20	8.964639	2300	11.035361	10.001837	11.037199	44
17	8.964170	2273	9.998151	20	8.966019	2293	11.033981	10.001849	11.035830	43
18	8.965534	2266	9.998139	18	8.967394	2286	11.032606	10.001861	11.034466	42
19	8.966893	2259	9.998128	20	8.968766	2279	11.031234	10.001872	11.033107	41
20	8.968249	2252	9.998116	20	8.970133	2271	11.029867	10.001884	11.031751	40
21	8.969600	2245	9.998104	20	8.971496	2265	11.028504	10.001896	11.030400	39
22	8.970947	2238	9.998092	20	8.972855	2257	11.027145	10.001908	11.029053	38
23	8.972289	2231	9.998080	20	8.974209	2251	11.025791	10.001920	11.027711	37
24	8.973628	2224	9.998068	20	8.975560	2244	11.024440	10.001932	11.026372	36
25	8.974962	2217	9.998056	20	8.976906	2237	11.023094	10.001944	11.025038	35
26	8.976293	2210	9.998044	20	8.978248	2230	11.021752	10.001956	11.023707	34
27	8.977619	2203	9.998032	20	8.979586	2223	11.020414	10.001968	11.022381	33
28	8.978941	2197	9.998020	20	8.980921	2217	11.019079	10.001980	11.021059	32
29	8.980259	2190	9.998008	20	8.982251	2210	11.017749	10.001992	11.019741	31
30	8.981573	2183	9.997996	20	8.983577	2204	11.016423	10.002004	11.018427	30
31	8.982883	2177	9.997984	20	8.984899	2197	11.015101	10.002016	11.017117	29
32	8.984189	2170	9.997972	22	8.986217	2191	11.013783	10.002028	11.015811	28
33	8.985491	2163	9.997959	20	8.987532	2184	11.012468	10.002041	11.014509	27
34	8.986789	2157	9.997947	20	8.988842	2178	11.011158	10.002053	11.013211	26
35	8.988083	2150	9.997935	22	8.990149	2171	11.009851	10.002065	11.011917	25
36	8.989374	2144	9.997922	20	8.991451	2165	11.008549	10.002078	11.010626	24
37	8.990660	2138	9.997910	22	8.992750	2158	11.007250	10.002090	11.009340	23
38	8.991943	2131	9.997897	20	8.994045	2152	11.005955	10.002103	11.008057	22
39	8.993222	2125	9.997885	22	8.995337	2146	11.004663	10.002115	11.006778	21
40	8.994497	2119	9.997872	20	8.996624	2140	11.003376	10.002128	11.005503	20
41	8.995768	2112	9.997860	22	8.997908	2134	11.002092	10.002140	11.004232	19
42	8.997036	2106	9.997847	20	8.999188	2127	11.000812	10.002153	11.002964	18
43	8.998299	2100	9.997835	22	8.000465	2121	10.999535	10.002165	11.001701	17
44	8.999560	2094	9.997822	22	9.001738	2115	10.998262	10.002178	11.000440	16
45	9.000816	2088	9.997809	20	9.003007	2109	10.996993	10.002191	10.999184	15
46	9.002069	2082	9.997797	22	9.004272	2103	10.995728	10.002203	10.997931	14
47	9.003318	2076	9.997784	22	9.005534	2097	10.994466	10.002216	10.996682	13
48	9.004563	2070	9.997771	22	9.006792	2091	10.993208	10.002229	10.995437	12
49	9.005805	2064	9.997758	22	9.008047	2085	10.991953	10.002242	10.994195	11
50	9.007044	2058	9.997745	22	9.009298	2079	10.990702	10.002255	10.992956	10
51	9.008278	2052	9.997732	22	9.010546	2074	10.989454	10.002268	10.991722	9
52	9.009510	2046	9.997719	22	9.011790	2068	10.988210	10.002281	10.990490	8
53	9.010737	2040	9.997706	22	9.013031	2062	10.986969	10.002294	10.989263	7
54	9.011962	2034	9.997693	22	9.014268	2056	10.985732	10.002307	10.988038	6
55	9.013182	2029	9.997680	22	9.015502	2051	10.984498	10.002320	10.986818	5
56	9.014400	2023	9.997667	22	9.016732	2045	10.983268	10.002333	10.985600	4
57	9.015613	2017	9.997654	22	9.017959	2039	10.982041	10.002346	10.984387	3
58	9.016824	2012	9.997641	22	9.019183	2034	10.980817	10.002359	10.983176	2
59	9.018031	2006	9.997628	23	9.020403	2028	10.979597	10.002372	10.981969	1
60	9.019235		9.997614		9.021620		10.978380	10.002386	10.980765	0
M	Co-sine.		Sine.		Co-tang.		Tang.	Co-sec.	Secant.	M

84 Degrees.

TABLE XIX.

LOGARITHMIC SINES TANGENTS AND SECANTS.

6 Degrees.

M	Sine.	Diff.	Co-sine.	D.	Tang.	Diff.	Co-tang.	Secant.	Co-sec.	M
0	9.019235	2000	9.997614	22	9.021620	2023	10.978380	10.002386	10.980765	60
1	9.020435	1995	9.997601	22	9.022834	2017	10.977166	10.002399	10.979565	59
2	9.021632	1989	9.997588	23	9.024044	2011	10.975956	10.002412	10.978368	58
3	9.022825	1984	9.997574	22	9.025251	2006	10.974749	10.002426	10.977175	57
4	9.024016	1978	9.997561	23	9.026455	2001	10.973545	10.002439	10.975984	56
5	9.025203	1973	9.997547	22	9.027655	1995	10.972345	10.002453	10.974797	55
6	9.026386	1967	9.997534	23	9.028852	1990	10.971148	10.002466	10.973614	54
7	9.027567	1962	9.997520	22	9.030046	1985	10.969954	10.002480	10.972433	53
8	9.028744	1957	9.997507	23	9.031237	1979	10.968763	10.002493	10.971256	52
9	9.029918	1951	9.997493	22	9.032425	1974	10.967575	10.002507	10.970082	51
10	9.031089	1946	9.997480	23	9.033609	1969	10.966391	10.002520	10.968911	50
11	9.032257	1941	9.997466	23	9.034791	1964	10.965209	10.002534	10.967743	49
12	9.033421	1936	9.997452	22	9.035969	1958	10.964031	10.002548	10.966579	48
13	9.034582	1930	9.997439	23	9.037144	1953	10.962856	10.002561	10.965418	47
14	9.035741	1925	9.997425	23	9.038316	1948	10.961684	10.002575	10.964259	46
15	9.036896	1920	9.997411	23	9.039485	1943	10.960515	10 002589	10.963104	45
16	9.038048	1915	9.997397	23	9.040651	1938	10.959349	10.002603	10.961952	44
17	9.039197	1910	9.997383	23	9.041813	1933	10.958187	10.002617	10.960803	43
18	9.040342	1905	9.997369	23	9.042973	1928	10.957027	10.002631	10.959658	42
19	9.041485	1899	9.997355	23	9.044130	1923	10.955870	10.002645	10.958515	41
20	9.042625	1895	9.997341	23	9.045284	1918	10.954716	10.002659	10.957375	40
21	9.043762	1889	9.997327	23	9.046434	1913	10.953566	10.002673	10.956238	39
22	9.044895	1884	9.997313	23	9.047582	1908	10.952418	10.002687	10.955105	38
23	9.046026	1879	9.997299	23	9.048727	1903	10.951273	10.002701	10.953974	37
24	9.047154	1875	9.997285	23	9.049869	1898	10.950131	10.002715	10.952846	36
25	9.048279	1870	9.997271	23	9.051008	1893	10.948992	10.002729	10.951721	35
26	9.049400	1865	9.997257	25	9.052144	1889	10.947856	10.002743	10.950600	34
27	9.050519	1860	9.997242	23	9.053277	1884	10.946723	10.002758	10.949481	33
28	9.051635	1855	9.997228	23	9.054407	1879	10.945593	10.002772	10.948365	32
29	9.052749	1850	9.997214	25	9.055535	1874	10.944465	10.002786	10.947251	31
30	9.053859	1845	9.997199	23	9.056659	1870	10.943341	10.002801	10.946141	30
31	9.054966	1841	9.997185	25	9.057781	1865	10.942219	10.002815	10.945034	29
32	9.056071	1836	9.997170	23	9.058900	1860	10.941100	10.002830	10.943929	28
33	9.057172	1831	9.997156	25	9.060016	1855	10.939984	10.002844	10.942828	27
34	9.058271	1827	9.997141	23	9.061130	1851	10.938870	10.002859	10.941729	26
35	9.059367	1822	9.997127	25	9.062240	1846	10.937760	10.002873	10.940633	25
36	9.060460	1817	9.997112	23	9.063348	1842	10.936652	10.002888	10.939540	24
37	9.061551	1813	9.997098	25	9.064453	1837	10.935547	10.002902	10.938449	23
38	9.062639	1808	9.997083	25	9.065556	1833	10.934444	10.002917	10.937361	22
39	9.063724	1804	9.997068	25	9.066655	1828	10.933345	10.002932	10.936276	21
40	9.064806	1799	9.997053	23	9.067752	1824	10.932248	10.002947	10.935194	20
41	9.065885	1794	9.997039	25	9.068846	1819	10.931154	10.002961	10.934115	19
42	9.066962	1790	9.997024	25	9.069938	1815	10.930062	10.002976	10.933038	18
43	9.068036	1786	9.997009	25	9.071027	1810	10.928973	10.002991	10.931964	17
44	9.069107	1781	9.996994	25	9.072113	1806	10.927887	10.003006	10.930893	16
45	9.070176	1777	9.996979	25	9.073197	1802	10.926803	10.003021	10.929824	15
46	9.071242	1772	9.996964	25	9.074278	1797	10.925722	10.003036	10.928758	14
47	9.072306	1768	9.996949	25	9.075356	1793	10.924644	10.003051	10.927694	13
48	9.073366	1763	9.996934	25	9.076432	1789	10.923568	10.003066	10.926634	12
49	9.074424	1759	9.996919	25	9.077505	1784	10.922495	10.003081	10.925576	11
50	9.075480	1755	9.996904	25	9.078576	1780	10.921424	10.003096	10.924520	10
51	9.076533	1750	9.996889	25	9.079644	1776	10.920356	10.003111	10.923467	9
52	9.077583	1746	9.996874	27	9.080710	1772	10.919290	10.003126	10.922417	8
53	9.078631	1742	9.996858	25	9.081773	1767	10.918227	10.003142	10.921369	7
54	9.079676	1738	9.996843	25	9.082833	1763	10.917167	10.003157	10.920324	6
55	9.080719	1733	9.996828	27	9.083891	1759	10.916109	10.003172	10.919281	5
56	9.081759	1729	9.996812	25	9.084947	1755	10.915053	10.003188	10.918241	4
57	9.082797	1725	9.996797	25	9.086000	1751	10.914000	10.003203	10.917203	3
58	9.083832	1721	9.996782	27	9.087050	1747	10.912950	10.003218	10.916168	2
59	9.084864	1717	9.996766	25	9.088098	1743	10.911902	10.003234	10.915136	1
60	9.085894		9.996751		9.089144		10.910856	10.003249	10.914106	0
M	Co-sine.		Sine.		Co-tang.		Tang.	Co-sec.	Secant.	M

83 Degrees.

TABLE XIX.

LOGARITHMIC SINES, TANGENTS, AND SECANTS.

7 Degrees.

M	Sine.	Diff.	Co-sine.	D.	Tang.	Diff.	Co-tang.	Secant.	Co-sec.	M
0	9·085894	1713	9.996751	27	9.089144	1738	10.910856	10.003249	10.914106	60
1	9.086922	1709	9.996735	25	9.090187	1735	10.909813	10.003265	10.913078	59
2	9.087947	1704	9.996720	27	9.091228	1731	10.908772	10.003280	10.912053	58
3	9.088970	1700	9.996704	27	9.092266	1727	10.907734	10.003296	10.911030	57
4	9.089990	1696	9.996688	25	9.093302	1722	10.906698	10.003312	10.910010	56
5	9.091008	1692	9.996673	27	9.094336	1719	10.905664	10.003327	10.908992	55
6	9.092024	1688	9.996657	27	9.095367	1715	10.904633	10.003343	10.907976	54
7	9.093037	1684	9.996641	27	9.096395	1711	10.903605	10.003359	10.906963	53
8	9.094047	1680	9.996625	25	9.097422	1707	10.902578	10.003375	10.905953	52
9	9.095056	1676	9.996610	27	9.098446	1703	10.901554	10.003390	10.904944	51
10	9.096062	1673	9.996594	27	9.099468	1699	10.900532	10.003406	10.903938	50
11	9.097065	1668	9.996578	27	9.100487	1695	10.899513	10.003422	10.902935	49
12	9.098066	1665	9.996562	27	9.101504	1691	10.898496	10.003438	10.901934	48
13	9.099065	1661	9.996546	27	9.102519	1687	10.897481	10.003454	10.900935	47
14	9.100062	1657	9.996530	27	9.103532	1684	10.896468	10.003470	10.899938	46
15	9.101056	1653	9.996514	27	9.104542	1680	10.895458	10.003486	10.898944	45
16	9.102048	1649	9.996498	27	9.105550	1676	10.894450	10.003502	10.897952	44
17	9.103037	1645	9.996482	28	9.106556	1672	10.893444	10.003518	10.896963	43
18	9.104025	1642	9.996465	27	9.107559	1669	10.892441	10.003535	10.895975	42
19	9.105010	1638	9.996449	27	9.108560	1665	10.891440	10.003551	10.894990	41
20	9.105992	1634	9.996433	27	9.109559	1661	10.890441	10.003567	10.894008	40
21	9.106973	1630	9.996417	28	9.110556	1658	10.889444	10.003583	10.893027	39
22	9.107951	1627	9.996400	27	9.111551	1654	10.888449	10.003600	10.892049	38
23	9.108927	1623	9.996384	27	9.112543	1650	10.887457	10.003616	10.891073	37
24	9.109901	1619	9.996368	28	9.113533	1647	10.886467	10.003632	10.890099	36
25	9.110873	1616	9.996351	27	9.114521	1643	10.885479	10.003649	10.889127	35
26	9.111842	1612	9.996335	28	9.115507	1639	10.884493	10.003665	10.888158	34
27	9.112809	1608	9.996318	27	9.116491	1636	10.883509	10.003682	10.887191	33
28	9.113774	1605	9.996302	28	9.117472	1632	10.882528	10.003698	10.886226	32
29	9.114737	1601	9.996285	27	9.118452	1629	10.881548	10.003715	10.885263	31
30	9.115698	1597	9.996269	28	9.119429	1625	10.880571	10.003731	10.884302	30
31	9.116656	1594	9.996252	28	9.120404	1622	10.879596	10.003748	10.883344	29
32	9.117613	1590	9.996235	27	9.121377	1618	10.878623	10.003765	10.882387	28
33	9.118567	1587	9.996219	28	9.122348	1615	10.877652	10.003781	10.881433	27
34	9.119519	1583	9.996202	28	9.123317	1611	10.876683	10.003798	10.880481	26
35	9.120469	1580	9.996185	28	9.124284	1608	10.875716	10.003815	10.879531	25
36	9.121417	1576	9.996168	28	9.125249	1604	10.874751	10.003832	10.878583	24
37	9.122362	1573	9.996151	28	9.126211	1601	10.873787	10.003849	10.877638	23
38	9.123306	1569	9.996134	28	9.127172	1597	10.872828	10.003866	10.876694	22
39	9.124248	1566	9.996117	28	9.128130	1594	10.871870	10.003883	10.875752	21
40	9.125187	1562	9.996100	28	9.129087	1591	10.870913	10.003900	10.874813	20
41	9.126125	1559	9.996083	28	9.130041	1587	10.869959	10.003917	10.873875	19
42	9.127060	1556	9.996066	28	9.130994	1584	10.869006	10.003934	10.872940	18
43	9.127993	1552	9.996049	28	9.131944	1581	10.868056	10.003951	10.872007	17
44	9.128925	1549	9.996032	28	9.132893	1577	10.867107	10.003968	10.871075	16
45	9.129854	1545	9.996015	28	9.133839	1574	10.866161	10.003985	10.870146	15
46	9.130781	1542	9.995998	30	9.134784	1571	10.865216	10.004002	10.869219	14
47	9.131706	1539	9.995980	28	9.135726	1567	10.864274	10.004020	10.868294	13
48	9.132630	1535	9.995963	28	9.136667	1564	10.863333	10.004037	10.867370	12
49	9.133551	1532	9.995940	30	9.137605	1561	10.862395	10.004054	10.866449	11
50	9.134470	1529	9.995928	28	9.138542	1558	10.861458	10.004072	10.865530	10
51	9.135387	1525	9.995911	28	9.139476	1555	10.860524	10.004089	10.864613	9
52	9.136303	1522	9.995894	30	9.140409	1551	10.859591	10.004106	10.863697	8
53	9.137216	1519	9.995876	28	9.141340	1548	10.858660	10.004124	10.862784	7
54	9.138128	1516	9.995859	30	9.142269	1545	10.857731	10.004141	10.861872	6
55	9.139037	1512	9.995841	30	9.143196	1542	10.856804	10.004159	10.860963	5
56	9.139944	1509	9.995823	28	9.144121	1539	10.855879	10.004177	10.860056	4
57	9.140850	1506	9.995806	30	9.145044	1535	10.854956	10.004194	10.859150	3
58	9.141754	1503	9.995788	28	9.145966	1532	10.854034	10.004212	10.858246	2
59	9.142655	1500	9.995771	30	9.146885	1529	10.853115	10.004229	10.857345	1
60	9.143555		9.995753		9.147803		10.852197	10.004247	10.856445	0
M	Co-sine.		Sine.		Co-tang.		Tang.	Co-sec.	Secant.	M

82 Degrees.

TABLE XIX.

LOGARITHMIC SINES, TANGENTS, AND SECANTS.

8 Degrees.

M	Sine.	Diff.	Co-sine.	D.	Tang.	Diff.	Co-tang.	Secant.	Co-sec.	M
0	9.143555	1496	9.995753	30	9.147803	1526	10.852197	10.004247	10.856445	60
1	9.144453	1493	9.995735	30	9.148718	1523	10.851282	10.004265	10.855547	59
2	9.145349	1490	9.995717	30	9.149632	1520	10.850368	10.004283	10.854651	58
3	9.146243	1487	9.995699	30	9.150544	1517	10.849456	10.004301	10.853757	57
4	9.147136	1484	9.995681	28	9.151454	1514	10.848546	10.004319	10.852864	56
5	9.148026	1481	9.995664	30	9.152363	1511	10.847637	10.004336	10.851974	55
6	9.148915	1478	9.995646	30	9.153269	1508	10.846731	10.004354	10.851085	54
7	9.149802	1475	9.995628	30	9.154174	1505	10.845826	10.004372	10.850198	53
8	9.150686	1472	9.995610	32	9.155077	1502	10.844923	10.004390	10.849314	52
9	9.151569	1469	9.995591	30	9.155978	1499	10.844022	10.004409	10.848431	51
10	9.152451	1466	9.995573	30	9.156877	1496	10.843123	10.004427	10.847549	50
11	9.153330	1462	9.995555	30	9.157775	1493	10.842225	10.004445	10.846670	49
12	9.154208	1460	9.995537	30	9.158671	1490	10.841329	10.004463	10.845792	48
13	9.155083	1457	9.995519	30	9.159565	1487	10.840435	10.004481	10.844917	47
14	9.155957	1454	9.995501	32	9.160457	1484	10.839543	10.004499	10.844043	46
15	9.156830	1451	9.995482	30	9.161347	1481	10.838653	10.004518	10.843170	45
16	9.157700	1448	9.995464	30	9.162236	1478	10.837764	10.004536	10.842300	44
17	9.158569	1445	9.995446	32	9.163123	1475	10.836877	10.004554	10.841431	43
18	9.159435	1442	9.995427	30	9.164008	1473	10.835992	10.004573	10.840565	42
19	9.160301	1439	9.995409	32	9.164892	1470	10.835108	10.004591	10.839699	41
20	9.161164	1436	9.995390	30	9.165774	1467	10.834226	10.004610	10.838836	40
21	9.162025	1433	9.995372	32	9.166654	1464	10.833346	10.004628	10.837975	39
22	9.162885	1430	9.995353	32	9.167532	1461	10.832468	10.004647	10.837115	38
23	9.163743	1427	9.995334	30	9.168409	1458	10.831591	10.004666	10.836257	37
24	9.164600	1424	9.995316	32	9.169284	1455	10.830716	10.004684	10.835400	36
25	9.165454	1422	9.995297	32	9.170157	1453	10.829843	10.004703	10.834546	35
26	9.166307	1419	9.995278	30	9.171029	1450	10.828971	10.004722	10.833693	34
27	9.167159	1416	9.995260	32	9.171899	1447	10.828101	10.004740	10.832841	33
28	9.168008	1413	9.995241	32	9.172767	1444	10.827233	10.004759	10.831992	32
29	9.168856	1410	9.995222	32	9.173634	1442	10.826366	10.004778	10.831144	31
30	9.169702	1407	9.995203	32	9.174499	1439	10.825501	10.004797	10.830298	30
31	9.170547	1405	9.995184	32	9.175362	1436	10.824638	10.004816	10.829453	29
32	9.171389	1402	9.995165	32	9.176224	1433	10.823776	10.004835	10.828611	28
33	9.172230	1399	9.995146	32	9.177084	1431	10.822916	10.004854	10.827770	27
34	9.173070	1396	9.995127	32	9.177942	1428	10.822058	10.004873	10.826930	26
35	9.173908	1394	9.995108	32	9.178799	1425	10.821201	10.004892	10.826092	25
36	9.174744	1391	9.995089	32	9.179655	1423	10.820345	10.004911	10.825256	24
37	9.175578	1388	9.995070	32	9.180508	1420	10.819492	10.004930	10.824422	23
38	9.176411	1385	9.995051	32	9.181360	1417	10.818640	10.004949	10.823589	22
39	9.177242	1383	9.995032	32	9.182211	1415	10.817789	10.004968	10.822758	21
40	9.178072	1380	9.995013	33	9.183059	1412	10.816941	10.004987	10.821928	20
41	9.178900	1377	9.994993	32	9.183907	1409	10.816093	10.005007	10.821100	19
42	9.179726	1374	9.994974	32	9.184752	1407	10.815248	10.005026	10.820274	18
43	9.180551	1372	9.994955	33	9.185597	1404	10.814403	10.005045	10.819449	17
44	9.181374	1369	9.994935	32	9.186439	1402	10.813561	10.005065	10.818626	16
45	9.182196	1367	9.994916	33	9.187280	1399	10.812720	10.005084	10.817804	15
46	9.183016	1364	9.994896	32	9.188120	1396	10.811880	10.005104	10.816984	14
47	9.183834	1361	9.994877	33	9.188958	1394	10.811042	10.005123	10.816166	13
48	9.184651	1359	9.994857	32	9.189794	1391	10.810206	10.005143	10.815349	12
49	9.185466	1356	9.994838	33	9.190629	1389	10.809371	10.005162	10.814534	11
50	9.186280	1353	9.994818	33	9.191462	1386	10.808538	10.005182	10.813720	10
51	9.187092	1351	9.994798	32	9.192294	1384	10.807706	10.005202	10.812908	9
52	9.187903	1348	9.994779	33	9.193124	1381	10.806876	10.005221	10.812097	8
53	9.188712	1346	9.994759	33	9.193953	1379	10.806047	10.005241	10.811288	7
54	9.189519	1343	9.994739	32	9.194780	1376	10.805220	10.005261	10.810481	6
55	9.190325	1341	9.994720	33	9.195606	1374	10.804394	10.005281	10.809675	5
56	9.191130	1338	9.994700	33	9.196430	1371	10.803570	10.005300	10.808870	4
57	9.191933	1336	9.994680	33	9.197253	1369	10.802747	10.005320	10.808067	3
58	9.192734	1333	9.994660	33	9.198074	1366	10.801926	10.005340	10.807266	2
59	9.193534	1330	9.994640	33	9.198894	1364	10.801106	10.005360	10.806466	1
60	9.194332		9.994620		9.199713		10.800287	10.005380	10.805668	0
M	Co-sine.		Sine.		Co-tang.		Tang.	Co-sec.	Secant.	M

81 Degrees.

LOGARITHMIC SINES, TANGENTS, AND SECANTS.

9 Degrees.

M	Sine.	Diff.	Co-sine.	D.	Tang.	Diff.	Co-tang.	Secant.	Co-sec.	M
0	9.194332	1328	9.994620	33	9.199713	1361	10 800287	10.005380	10.805668	60
1	9.195129	1326	9.994600	33	9.200529	1359	10.799471	10.005400	10.804871	59
2	9.195925	1323	9.994580	33	9.201345	1356	10.798655	10.005420	10.804075	58
3	9.196719	1321	9.994560	33	9.202159	1354	10.797841	10.005440	10.803281	57
4	9.197511	1318	9.994540	35	9.202971	1352	10.797029	10.005460	10.803489	56
5	9.198302	1316	9.994519	33	9.203782	1349	10.796218	10.005481	10.802698	55
6	9.199091	1313	9.994499	33	9.204592	1347	10.795408	10.005501	10.800909	54
7	9.199879	1311	9.994479	33	9.205400	1345	10.794600	10.005521	10.800121	53
8	9.200666	1308	9.994459	35	9.206207	1342	10.793793	10.005541	10.799334	52
9	9.201451	1306	9.994438	33	9.207013	1340	10.792987	10.005562	10.798549	51
10	9.202234	1304	9.994418	33	9.207817	1338	10.792183	10.005582	10.797766	50
11	9.203017	1301	9.994398	35	9.208619	1335	10.791381	10.005602	10.796983	49
12	9.203797	1299	9.994377	33	9.209420	1333	10.790580	10.005623	10.796203	48
13	9.204577	1296	9.994357	35	9.210220	1331	10.789780	10.005643	10.795423	47
14	9.205354	1294	9.994336	33	9.211018	1328	10.788982	10.005664	10.794646	46
15	9.206131	1292	9.994316	35	9.211815	1326	10.788185	10.005684	10.793869	45
16	9.206906	1289	9.994295	35	9.212611	1324	10.787389	10.005705	10.793094	44
17	9.207679	1287	9.994274	33	9.213405	1321	10.786595	10.005726	10.792321	43
18	9.208452	1285	9.994254	35	9.214198	1319	10.785802	10.005746	10.791548	42
19	9.209222	1282	9.994233	35	9.214989	1317	10.785011	10.005767	10.790778	41
20	9.209992	1280	9 994212	35	9.215780	1315	10.784220	10.005788	10.790008	40
21	9.210760	1278	9.994191	33	9.216568	1312	10.783432	10.005809	10.789240	39
22	9.211526	1275	9.994171	35	9.217356	1310	10.782644	10.005829	10.788474	38
23	9.212291	1273	9.994150	35	9.218142	1308	10.781858	10.005850	10.787709	37
24	9.213055	1271	9.994129	35	9.218926	1305	10.781074	10.005871	10.786945	36
25	9.213818	1268	9.994108	35	9.219710	1303	10.780290	10.005892	10.786182	35
26	9.214579	1266	9.994087	35	9.220492	1301	10.779508	10.005913	10.785421	34
27	9.215338	1264	9.994066	35	9.221272	1299	10.778728	10.005934	10.784662	33
28	9.216097	1261	9.994045	35	9.222052	1297	10.777948	10.005955	10.783903	32
29	9.216854	1259	9.994021	35	9.222830	1294	10.777170	10.005976	10.783146	31
30	9.217609	1257	9.994003	35	9.223607	1292	10.776393	10.005997	10.782391	30
31	9.218363	1255	9.993982	37	9.224382	1290	10.775618	10.006018	10.781637	29
32	9.219116	1253	9.993960	35	9.225156	1288	10.774844	10.006040	10.780884	28
33	9.219868	1250	9.993939	35	9.225929	1286	10.774071	10.006061	10.780132	27
34	9.220618	1248	9.993918	35	9.226700	1284	10.773300	10.006082	10.779382	26
35	9.221367	1246	9.993897	37	9.227471	1281	10.772529	10.006103	10.778633	25
36	9.222115	1244	9.993875	35	9.228239	1279	10.771761	10.006125	10.777885	24
37	9.222861	1242	9.993854	37	9.229007	1277	10.770993	10.006146	10.777139	23
38	9.223606	1239	9.993832	35	9.229773	1275	10.770227	10.006168	10.776394	22
39	9.224349	1237	9.993811	37	9.230539	1273	10.769461	10.006189	10.775651	21
40	9.225092	1235	9.993789	35	9.231302	1271	10.768698	10.006211	10.774908	20
41	9.225833	1233	9.993768	37	9.232065	1269	10.767935	10.006232	10.774167	19
42	9.226573	1231	9.993746	35	9.232826	1267	10.767174	10.006254	10.773427	18
43	9.227311	1228	9.993725	37	9.233586	1265	10.766414	10.006275	10.772689	17
44	9.228048	1226	9.993703	37	9.234345	1262	10.765655	10.006297	10.771952	16
45	9.228784	1224	9.993681	35	9.235103	1260	10.764897	10.006319	10.771216	15
46	9.229518	1222	9.993660	37	9.235859	1258	10.764141	10.006340	10.770482	14
47	9.230252	1220	9.993638	37	9.236614	1256	10.763386	10.006362	10.769748	13
48	9.230984	1218	9.993616	37	9.237368	1254	10.762632	10.006384	10.769016	12
49	9.231715	1216	9.993594	37	9.238120	1252	10.761880	10.006406	10.768285	11
50	9.232444	1214	9.993572	37	9.238872	1250	10.761128	10 006428	10.767556	10
51	9.233172	1212	9.993550	37	9.239622	1248	10.760378	10.006450	10.766828	9
52	9.233899	1209	9.993528	37	9.240371	1246	10.759629	10.006472	10.766101	8
53	9.234625	1207	9.993506	37	9.241118	1244	10.758882	10.006494	10.765375	7
54	9.235349	1205	9.993484	37	9.241865	1242	10.758135	10.006516	10.764651	6
55	9.236073	1203	9.993462	37	9.242610	1240	10.757390	10.006538	10.763927	5
56	9.236795	1201	9.993440	37	9.243354	1238	10.756646	10.006560	10.763205	4
57	9.237515	1199	9.993418	37	9.244097	1236	10.755903	10.006582	10 762485	3
58	9.238235	1197	9.993396	37	9.244839	1234	10.755161	10.006604	10.761765	2
59	9.238953	1195	9.993374	38	9.245579	1232	10.754421	10.006626	10.761047	1
60	9.239670		9.993351		9.246319		10.753681	10.006649	10.760330	0
M	Co-sine.		Sine.		Co-tang.		Tang.	Co-sec.	Secant.	M

80 Degrees.

LOGARITHMIC SINES, TANGENTS, AND SECANTS.

10 Degrees.

M	Sine.	Diff.	Co-sine.	D.	Tang.	Diff.	Co-tang.	Secant.	Co-sec.	M
0	9.239670	1193	9.993351	37	9.246319	1230	10.753681	10.006649	10.760330	60
1	9 240386	1191	9.993329	37	9.247057	1228	10.752943	10.006671	10.759614	59
2	9.241101	1189	9.993307	38	9.247794	1226	10.752206	10.006693	10.758899	58
3	9.241814	1187	9.993285	37	9.248530	1224	10.751470	10.006715	10.758186	57
4	9.242526	1185	9.993262	37	9.249264	1222	10.750736	10.006738	10.757474	56
5	9.243237	1183	9.993240	38	9.249998	1220	10.750002	10.006760	10.756763	55
6	9.243947	1181	9.993217	37	9.250730	1218	10.749270	10.006783	10.756053	54
7	9.244656	1179	9.993195	38	9.251461	1217	10.748539	10.006805	10.755344	53
8	9.245363	1177	9.993172	38	9.252191	1215	10.747809	10.006828	10.754637	52
9	9.246069	1175	9.993149	37	9.252920	1213	10.747080	10.006851	10.753931	51
10	9.246775	1173	9.993127	38	9.253648	1211	10.746352	10 006873	10.753225	50
11	9.247478	1171	9.993104	38	9.254374	1209	10.745626	10.006896	10.752522	49
12	9.246181	1169	9.993081	37	9.255100	1207	10.744900	10.006919	10.751819	48
13	9.248883	1167	9.993059	38	9.255824	1205	10.744176	10.006941	10.751117	47
14	9.249583	1165	9.993036	38	9.256547	1203	10.743453	10.006964	10.750417	46
15	9.250282	1163	9.993013	38	9.257269	1201	10.742731	10.006987	10.749718	45
16	9.250980	1161	9.992990	38	9.257990	1200	10.742010	10.007010	10.749020	44
17	9.251677	1159	9.992967	38	9.258710	1198	10.741290	10.007033	10.748323	43
18	9.252373	1158	9.992944	38	9.259429	1196	10.740571	10.007056	10.747627	42
19	9.253067	1156	9.992921	38	9.260146	1194	10.739854	10.007079	10.746933	41
20	9.253761	1154	9.992898	38	9.260863	1192	10.739137	10.007102	10.746239	40
21	9.254453	1152	9.992875	38	9.261578	1190	10.738422	10.007125	10.745547	39
22	9.255144	1150	9.992852	38	9.262292	1189	10.737708	10.007148	10.744856	38
23	9.255834	1148	9.992829	38	9.263005	1187	10.736995	10.007171	10.744166	37
24	9.256523	1146	9.992806	38	9.263717	1185	10.736283	10.007194	10.743477	36
25	9.257211	1144	9.992783	40	9.264428	1183	10.735572	10.007217	10.742789	35
26	9.257898	1142	9.992759	38	9.269138	1181	10.734862	10.007241	10.742102	34
27	9.258583	1141	9.992736	38	9.265847	1179	10.734153	10.007264	10.741417	33
28	9.259268	1139	9.992713	38	9.266555	1178	10.733445	10.007287	10.740732	32
29	9.259951	1137	9.992690	40	9.267261	1176	10.732739	10.007311	10.740049	31
30	9.260633	1135	9.992666	38	9.267967	1174	10.732033	10.007334	10.739367	30
31	9.261314	1133	9.992643	40	9.268671	1172	10.731329	10.007357	10.738686	29
32	9.261994	1131	9.992619	38	9.269375	1170	10.730625	10.007381	10.738006	28
33	9.262673	1130	9.992596	40	9.270077	1169	10.729923	10.007404	10.737327	27
34	9.263351	1128	9.992572	38	9.270779	1167	10.729221	10.007428	10.736649	26
35	9.264027	1126	9.992549	40	9.271479	1165	10.728521	10.007451	10.735973	25
36	9.264703	1124	9.992525	40	9.272178	1164	10.727822	10.007475	10.735297	24
37	9.265377	1122	9.992501	38	9.272876	1162	10.727124	10.007499	10.734923	23
38	9.266051	1120	9.992478	40	9.273573	1160	10.726427	10.007522	10.733949	22
39	9.266723	1119	9.992454	40	9.274269	1158	10.725731	10.007546	10.733277	21
40	9 267395	1117	9.992430	40	9.274964	1157	10.725036	10.007570	10.732605	20
41	9.268065	1115	9.992406	40	9.275658	1155	10.724342	10.007594	10.731935	19
42	9.268734	1113	9 992382	38	9.276351	1153	10.723649	10.007618	10.731266	18
43	9.269402	1111	9.992358	40	9.277043	1151	10.722957	10.007642	10.730598	17
44	9.270069	1110	9.992335	40	9.277734	1150	10.722266	10.007665	10.729931	16
45	9.270735	1108	9.992311	40	9.278424	1148	10.721576	10.007689	10.729265	15
46	9.271400	1106	9.992287	40	9.279113	1146	10.720887	10.007713	10.728600	14
47	9.272064	1105	9.992263	40	9.279801	1145	10.720199	10.007737	10.727936	13
48	9.272726	1103	9.992239	42	9.280488	1143	10.719512	10.007761	10.727274	12
49	9.273388	1101	9.992214	40	9.281174	1141	10.718826	10.007786	10.726612	11
50	9.274049	1099	9.992190	40	9.281858	1140	10.718142	10 007810	10.725951	10
51	9.274708	1098	9.992166	40	9.282542	1138	10.717458	10.007834	10.725292	9
52	9.275367	1096	9.992142	40	9.283225	1136	10.716775	10.007858	10.724633	8
53	9.276025	1094	9.992118	42	9.283907	1135	10.716093	10.007882	10.723975	7
54	9.276681	1092	9.992083	40	9.284588	1133	10.715412	10.007907	10.723319	6
55	9.277337	1091	9.992069	42	9.285268	1131	10.714732	10.007931	10.722663	5
56	9.277991	1089	9.992044	40	9.285947	1130	10.714053	10.007956	10.722009	4
57	9.278645	1087	9.992020	40	9.286624	1128	10.713376	10.007980	10.721355	3
58	9.279297	1086	9.991996	42	9.287301	1126	10.712699	10.008004	10.720703	2
59	9.279948	1084	9.991971	40	9.287977	1125	10.712023	10.008029	10.720052	1
60	9.280599		9.991947		9.288652		10.711348	10.008053	10.719401	0
M	Co-sine.		Sine.		Co-tang.		Tang.	Co-sec.	Secant.	M

79 Degrees.

TABLE XIX.

LOGARITHMIC SINES, TANGENTS, AND SECANTS.

11 Degrees.

M	Sine.	Diff.	Co-sine.	D.	Tang.	Diff.	Co-tang.	Secant.	Co-sec.	M
0	9.280599	1082	9.991947	42	9.288652	1123	10.711348	10.008053	10.719401	60
1	9.281248	1081	9.991922	42	9.289326	1122	10.710674	10.008078	10.718752	59
2	9.281897	1079	9.991897	40	9.289999	1120	10.710001	10.008103	10.718103	58
3	9.282544	1077	9.991873	42	9.290671	1118	10.709329	10.008127	10.717456	57
4	9.283190	1076	9.991848	42	9.291342	1117	10.708658	10.008152	10.716810	56
5	9.283836	1074	9.991823	40	9.292013	1115	10.707987	10.008177	10.716164	55
6	9.284480	1072	9.991799	42	9.292682	1114	10.707318	10.008201	10.715520	54
7	9.285124	1071	9.991774	42	9.293350	1112	10.706650	10.008226	10.714876	53
8	9.285766	1069	9.991749	42	9.294017	1111	10.705983	10.008251	10.714234	52
9	9.286408	1067	9.991724	42	9.294684	1109	10.705316	10.008276	10.713592	51
10	9.287048	1066	9.991699	42	9.295349	1107	10.704651	10.008301	10.712952	50
11	9.287688	1064	9.991674	42	9.296013	1106	10.703987	10.008326	10.712312	49
12	9.288326	1063	9.991649	42	9.296677	1104	10.703323	10.008351	10.711674	48
13	9.288964	1061	9.991624	42	9.297339	1103	10.702661	10.008376	10.711036	47
14	9.289600	1059	9.991599	42	9.298001	1101	10.701999	10.008401	10.710400	46
15	9.290236	1058	9.991574	42	9.298662	1100	10.701338	10.008426	10.709764	45
16	9.290870	1056	9.991549	42	9.299322	1098	10.700678	10.008451	10.709130	44
17	9.291504	1054	9.991524	43	9.299980	1096	10.700020	10.008476	10.708496	43
18	9.292137	1053	9.991498	42	9.300638	1095	10.699362	10.008502	10.707863	42
19	9.292768	1051	9.991473	42	9.301295	1093	10.698705	10.008527	10.707232	41
20	9.293399	1050	9.991448	43	9.301951	1092	10.698049	10.008552	10.706601	40
21	9.294029	1048	9.991422	42	9.302607	1090	10.697393	10.008578	10.705971	39
22	9.294658	1046	9.991397	42	9 303261	1089	10.696739	10.008603	10.705342	38
23	9.295286	1045	9.991372	43	9.303914	1087	10.696086	10.008628	10.704714	37
24	9.295913	1043	9.991346	42	9.304567	1086	10.695433	10.008654	10.704087	36
25	9.296539	1042	9.991321	43	9.305218	1084	10.694782	10.008679	10.703461	35
26	9.297164	1040	9.991295	42	9.305869	1083	10.694131	10.008705	10.702836	34
27	9.297788	1039	9.991270	43	9.306519	1081	10.693481	10.008730	10.702212	33
28	9.298412	1037	9.991244	43	9.307168	1080	10.692832	10.008756	10.701588	32
29	9.299034	1036	9.991218	42	9.307815	1078	10.692185	10.008782	10.700966	31
30	9.299655	1034	9.991193	43	9.308463	1077	10.691537	10.008807	10.700345	30
31	9.300276	1032	9.991167	43	9.309109	1075	10.690891	10.008833	10.699724	29
32	9.300895	1031	9.991141	43	9.309754	1074	10.690246	10.008859	10.699105	28
33	9.301514	1029	9.991115	42	9.310398	1073	10.689602	10.008885	10.698486	27
34	9.302132	1028	9.991090	43	9.311042	1071	10.688958	10.008910	10.697868	26
35	9.302748	1027	9.991064	43	9.311685	1070	10.688315	10.008936	10.697252	25
36	9.303364	1025	9.991038	43	9.312327	1068	10.687673	10.008962	10.696636	24
37	9.303979	1023	9.991012	43	9.312967	1067	10.687033	10.008988	10.696021	23
38	9.304593	1022	9.990986	43	9.313608	1065	10.686392	10.009014	10.695407	22
39	9.305207	1020	9.990960	43	9.314247	1064	10.685753	10.009040	10.694793	21
40	9.305819	1019	9.990934	43	9.314885	1062	10.685115	10.009066	10.694181	20
41	9.306430	1017	9.990908	43	9.315523	1061	10.684477	10.009092	10.693570	19
42	9.307041	1016	9.990882	45	9.316159	1060	10.683841	10.009118	10.692959	18
43	9.307650	1014	9.990855	43	9.316795	1058	10.683205	10.009145	10.692350	17
44	9.308259	1013	9.990829	43	9.317430	1057	10.682570	10.009171	10.691741	16
45	9.308867	1011	9.990803	43	9.318064	1055	10.681936	10.009197	10.691133	15
46	9.309474	1010	9.990777	45	9.318697	1054	10.681303	10.009223	10.690526	14
47	9.310080	1008	9.990750	43	9.319329	1053	10.680671	10.009250	10.689920	13
48	9.310685	1007	9.990724	45	9.319961	1051	10.680039	10.009276	10.689315	12
49	9.311289	1006	9.990697	43	9.320592	1050	10.679408	10.009303	10.688711	11
50	9.311893	1004	9.990671	43	9.321222	1048	10.678778	10.009329	10.688107	10
51	9.312495	1003	9.990645	45	9.321851	1047	10.678149	10.009355	10.687505	9
52	9.313097	1001	9.990618	45	9.322479	1045	10.677521	10.009382	10.686903	8
53	9.313698	1000	9.990591	43	9.323106	1044	10.676894	10.009409	10.686302	7
54	9.314297	998	9.990565	45	9.323733	1043	10.676267	10.009435	10.685703	6
55	9.314897	997	9.990538	45	9.324358	1041	10.675642	10.009462	10.685103	5
56	9.315495	996	9.990511	43	9.324983	1040	10.675017	10.009489	10.684505	4
57	9.316092	994	9.990485	45	9.325607	1039	10.674393	10.009515	10.683908	3
58	9.316689	993	9.990458	45	9 326231	1037	10.673769	10.009542	10.683311	2
59	9.317284	991	9.990431	45	9.326853	1036	10.673147	10.009569	10.682716	1
60	9.317879		9.990404		9.327475		10.672525	10.009596	10.682121	0
M	Co-sine.		Sine.		Co-tang.		Tang.	Co-sec.	Secant.	M

78 Degrees.

TABLE XIX.

LOGARITHMIC SINES, TANGENTS, AND SECANTS.

12 Degrees.

M	Sine.	Diff.	Co-sine.	D.	Tang.	Diff.	Co-tang.	Secant.	Co-sec.	M
0	9.317879	990	9.990404	43	9.327474	1035	10.672526	10.009596	10.682121	60
1	9.318473	988	9.990378	45	9.328095	1033	10.671905	10.009622	10.681527	59
2	9.319066	987	9.990351	45	9.328715	1032	10.671285	10.009649	10.680934	58
3	9.319658	986	9.990324	45	9.329334	1030	10.670666	10.009676	10.680342	57
4	9.320249	984	9.990297	45	9.329953	1029	10.670047	10.009703	10.679751	56
5	9.320840	983	9.990270	45	9.330570	1028	10.669430	10.009730	10.679160	55
6	9.321430	982	9.990243	47	9.331187	1026	10.668813	10.009757	10.678570	54
7	9.322019	980	9.990215	45	9.331803	1025	10.668197	10.009785	10.677981	53
8	9.322607	979	9.990188	45	9.332418	1024	10.667582	10.009812	10.677393	52
9	9.323194	977	9.990161	45	9.333033	1023	10.666967	10.009839	10.676806	51
10	9.323780	976	9.990134	45	9.333646	1021	10.666354	10.009866	10.676220	50
11	9.324366	975	9.990107	47	9.334259	1020	10.665741	10.009893	10.675634	49
12	9.324950	973	9.990079	45	9.334871	1019	10.665129	10.009921	10.675050	48
13	9.325534	972	9.990052	45	9.335482	1017	10.664518	10.009948	10.674466	47
14	9.326117	970	9.990025	47	9.336093	1016	10.663907	10.009975	10.673883	46
15	9.326700	969	9.989997	45	9.336702	1015	10.663298	10.010003	10.673300	45
16	9.327281	968	9.989970	47	9.337311	1013	10.662689	10.010030	10.672719	44
17	9.327862	966	9.989942	45	9.337919	1012	10.662081	10.010058	10.672138	43
18	9.328442	965	9.989915	47	9.338527	1011	10.661473	10.010085	10.671558	42
19	9.329021	964	9.989887	45	9.339133	1010	10.660867	10.010113	10.670979	41
20	9.329599	962	9.989860	47	9.339739	1008	10.660261	10.010140	10.670401	40
21	9.330176	961	9.989832	47	9.340344	1007	10.659656	10.010168	10.669824	39
22	9.330753	960	9.989804	45	9.340948	1006	10.659052	10.010196	10.669247	38
23	9.331329	958	9.989777	47	9.341552	1004	10.658448	10.010223	10.668671	37
24	9.331903	957	9.989749	47	9.342155	1003	10.657845	10.010251	10.668097	36
25	9.332478	956	9.989721	47	9.342757	1002	10.657243	10.010279	10.667522	35
26	9.333051	954	9.989693	47	9.343358	1001	10.656642	10.010307	10.666949	34
27	9.333624	953	9.989665	47	9.343958	999	10.656042	10.010335	10.666376	33
28	9.334195	952	9.989637	45	9.344558	998	10.655442	10.010363	10.665805	32
29	9.334767	950	9.989610	47	9.345157	997	10.654843	10.010390	10.665233	31
30	9.335337	949	9.989582	48	9.345755	996	10.654245	10.010418	10.664663	30
31	9.335906	948	9.989553	47	9.346353	994	10.653647	10.010447	10.664094	29
32	9.336475	946	9.989525	47	9.346949	993	10.653051	10.010475	10.663525	28
33	9.337043	945	9.989497	47	9.347545	992	10.652455	10.010503	10.662957	27
34	9.337610	944	9.989469	47	9.348141	991	10.651859	10.010531	10.662390	26
35	9.338176	943	9.989441	47	9.348735	990	10.651265	10.010559	10.661824	25
36	9.338742	941	9.989413	47	9.349329	988	10.650671	10.010587	10.661258	24
37	9.339307	940	9.989385	48	9.349922	987	10.650078	10.010615	10.660693	23
38	9.339871	939	9.989356	47	9.350514	986	10.649486	10.010644	10.660129	22
39	9.340434	937	9.989328	47	9.351106	985	10.648894	10.010672	10.659566	21
40	9.340996	936	9.989300	48	9.351697	983	10.648303	10.010700	10.659004	20
41	9.341558	935	9.989271	47	9.352287	982	10.647713	10.010729	10.658442	19
42	9.342119	934	9.989243	48	9.352876	981	10.647124	10.010757	10.657881	18
43	9.342679	932	9.989214	47	9.353465	980	10.646535	10.010786	10.657321	17
44	9.343239	931	9.989186	48	9.354053	979	10.645947	10.010814	10.656761	16
45	9.343797	930	9.989157	48	9.354640	977	10.645360	10.010843	10.656203	15
46	9.344355	929	9.989128	47	9.355227	976	10.644773	10.010872	10.655645	14
47	9.344912	927	9.989100	48	9.355813	975	10.644187	10.010900	10.655088	13
48	9.345469	926	9.989071	48	9.356398	974	10.643602	10.010929	10.654531	12
49	9.346024	925	9.989042	47	9.356982	973	10.643018	10.010958	10.653976	11
50	9.346579	924	9.989014	48	9.357566	971	10.642434	10.010986	10.653421	10
51	9.347134	922	9.988985	48	9.358149	970	10.641851	10.011015	10.652866	9
52	9.347687	921	9.988956	48	9.358731	969	10.641269	10.011044	10.652313	8
53	9.348240	920	9.988927	48	9.359313	968	10.640687	10.011073	10.651760	7
54	9.348792	919	9.988898	48	9.359893	967	10.640107	10.011102	10.651208	6
55	9.349343	917	9.988869	48	9.360474	966	10.639526	10.011131	10.650657	5
56	9.349893	916	9.988840	48	9.361053	965	10.638947	10.011160	10.650107	4
57	9.350443	915	9.988811	48	9.361632	963	10.638368	10.011189	10.649557	3
58	9.350992	914	9.988782	48	9.362210	962	10.637790	10.011218	10.649008	2
59	9.351540	913	9.988753	48	9.362787	961	10.637213	10.011247	10.648460	1
60	9.352088		9.988724		9.363364		10.636636	10.011276	10.647912	0
M	Co-sine.		Sine.		Co-tang.		Tang.	Co-sec.	Secant	M

77 Degrees.

TABLE XIX.

LOGARITHMIC SINES, TANGENTS, AND SECANTS.

13 Degrees.

M	Sine.	Diff.	Co-sine.	D.	Tang.	Diff.	Co-tang.	Secant.	Co-sec.	M
0	9.352088	911	9.988724	48	9.363364	960	10.636636	10.011276	10.647912	60
1	9.352635	910	9.988695	48	9.363940	959	10.636060	10.011305	10.647365	59
2	9.353181	909	9.988666	50	9.364515	958	10.635485	10.011334	10.646819	58
3	9.353726	908	9.988636	48	9.365090	957	10.634910	10.011364	10.646274	57
4	9.354271	907	9.988607	48	9.365664	955	10.634336	10.011393	10.645729	56
5	9.354815	905	9.988578	50	9.366237	954	10.633763	10.011422	10.645185	55
6	9.355358	904	9.988548	48	9.366810	953	10.633190	10.011452	10.644642	54
7	9.355901	903	9.988519	50	9.367382	952	10.632618	10.011481	10.644099	53
8	9.356443	902	9.988489	48	9.367953	951	10.632047	10.011511	10.643557	52
9	9.356984	901	9.988460	50	9.368524	950	10.631476	10.011540	10.643016	51
10	9.357524	899	9.988430	48	9.369094	949	10.630906	10.011570	10.642476	50
11	9.358064	898	9.988401	50	9.369663	948	10.630337	10.011599	10.641936	49
12	9.358603	897	9.988371	48	9.370232	946	10.629768	10.011629	10.641397	48
13	9.359141	896	9.988342	50	9.370799	945	10.629201	10.011658	10.640859	47
14	9.359678	895	9.988312	50	9.371367	944	10.628633	10.011688	10.640322	46
15	9.360215	893	9.988282	50	9.371933	943	10.628067	10.011718	10.639785	45
16	9.360752	892	9.988252	48	9.372499	942	10.627501	10.011748	10.639248	44
17	9.361287	891	9.988223	50	9.373064	941	10.626936	10.011777	10.638713	43
18	9.361822	890	9.988193	50	9.373629	940	10.626371	10.011807	10.638178	42
19	9.362356	889	9.988163	50	9.374193	939	10.625807	10.011837	10.637644	41
20	9.362889	888	9.988133	50	9.374756	938	10.625244	10.011867	10.637111	40
21	9.363422	887	9.988103	50	9.375319	937	10.624681	10.011897	10.636578	39
22	9.363954	885	9.988073	50	9.275881	935	10.624119	10.011927	10.636046	38
23	9.364485	884	9.988043	50	9.376442	934	10.623558	10.011957	10.635515	37
24	9.365016	883	9.988013	50	9.377003	933	10.622997	10.011987	10.634984	36
25	9.365546	882	9.987983	50	9.377563	932	10.622437	10.012017	10.634454	35
26	9.366075	881	9.987953	52	9.378122	931	10.621878	10.012047	10.633925	34
27	9.366604	880	9.987922	50	9.378681	930	10.621319	10.012078	10.633396	33
28	9.367131	879	9.987892	50	9.379239	929	10.620761	10.012108	10.632869	32
29	9.367659	878	9.987862	50	9.379797	928	10.620203	10.012138	10.632341	31
30	9.368185	876	9.987832	52	9.380354	927	10.619646	10.012168	10.631815	30
31	9.368711	875	9.987801	50	9.380910	926	10.619090	10.012199	10.631289	29
32	9.369236	874	9.987771	52	9.381466	925	10.618534	10.012229	10.630764	28
33	9.369761	873	9.987740	50	9.382020	924	10.617980	10.012260	10.630239	27
34	9.370285	872	9.987710	52	9.382575	923	10.617425	10.012290	10.629715	26
35	9.370808	871	9.987679	50	9.383129	922	10.616871	10.012321	10.629192	25
36	9.371330	870	9.987649	52	9.383682	921	10.616318	10.012351	10.628670	24
37	9.371852	869	9.987618	50	9.384234	920	10.615706	10.012382	10.628148	23
38	9.372373	867	9.987588	52	9.384786	919	10.615214	10.012412	10.627627	22
39	9.372894	866	9.987557	52	9.385337	918	10.614663	10.012443	10.627106	21
40	9.373414	865	9.987526	50	9.385888	917	10.614112	10.012474	10.626586	20
41	9.373933	864	9.987496	52	9.386438	916	10.613562	10.012504	10.626067	19
42	9.374452	863	9.987465	52	9.386987	914	10.613013	10.012535	10.625548	18
43	9.374970	862	9.987434	52	9.387536	913	10.612464	10.012566	10.625030	17
44	9.375487	861	9.987403	52	9.388084	912	10.611916	10.012597	10.624513	16
45	9.376003	860	9.987372	52	9.388631	911	10.611369	10.012628	10.623997	15
46	9.376519	859	9.987341	52	9.389178	910	10.610822	10.012659	10.623481	14
47	9.377035	858	9.987310	52	9.389724	909	10.610276	10.012690	10.622965	13
48	9.377549	857	9.987279	52	9.390270	908	10.609730	10.012721	10.622451	12
49	9.378063	856	9.987248	52	9.390815	907	10.609185	10.012752	10.621937	11
50	9.378577	854	9.987217	52	9.391360	906	10.608640	10.012783	10.621423	10
51	9.379089	853	9.987186	52	9.391903	905	10.608097	10.012814	10.620911	9
52	9.379601	852	9.987155	52	9.392447	904	10.607553	10.012845	10.620399	8
53	9.380113	851	9.987124	53	9.392989	903	10.607011	10.012876	10.619887	7
54	9.380624	850	9.987092	52	9.393531	902	10.606469	10.012908	10.619376	6
55	9.381134	849	9.987061	52	9.394073	901	10.605927	10.012939	10.618866	5
56	9.381643	848	9.987030	53	9.394614	900	10.605386	10.012970	10.618357	4
57	9.382152	847	9.986998	52	9.395154	899	10.604846	10.013002	10.617848	3
58	9.382661	846	9.986967	52	9.395694	898	10.604306	10.013033	10.617339	2
59	9.383168	845	9.986936	53	9.396233	897	10.603767	10.013064	10.616832	1
60	9.383675		9.986904		9.396771		10.603229	10.013096	10.616325	0
M	Co-sine.		Sine.		Co-tang.		Tang.	Co-sec.	Secant.	M

76 Degrees.

TABLE XIX.

LOGARITHMIC SINES, TANGENTS, AND SECANTS.

14 Degrees.

M	Sine.	Diff.	Co-sine.	D.	Tang.	Diff.	Co-tang.	Secant.	Co-sec.	M
0	9.383675	844	9.986904	52	9.396771	896	10.603229	10.013096	10.616325	60
1	9.384182	843	9.986873	53	9.397309	896	10.602691	10.013127	10.615818	59
2	9.384687	842	9.986841	53	9.397846	895	10.602154	10.013159	10.615313	58
3	9.385192	841	9.986809	52	9.398383	894	10.601617	10.013191	10.614808	57
4	9.385697	840	9.986778	53	9.398919	893	10.601081	10 013222	10.614303	56
5	9.386201	839	9.986746	53	9.399455	892	10.600545	10.013254	10.613799	55
6	9.386704	838	9.986714	52	9.399990	891	10.600010	10.013286	10.613296	54
7	9.387207	837	9.986683	53	9.400524	890	10.599476	10.013317	10.612793	53
8	9.387709	836	9.986651	53	9.401058	889	10.598942	10.013349	10.612291	52
9	9.388210	835	9.986619	53	9.401591	888	10.598409	10.013381	10.611790	51
10	9.388711	834	9.986587	53	9.402124	887	10.597876	10.013413	10.611289	50
11	9.389211	833	9.986555	53	9.402656	886	10.597344	10.013445	10.610789	49
12	9.389711	832	9.986523	53	9.403187	885	10.596813	10.013477	10.610289	48
13	9.390210	831	9.986491	53	9.403718	884	10.596282	10.013509	10.609790	47
14	9.390708	830	9.986459	53	9.404249	883	10.595751	10.013541	10.609292	46
15	9.391206	828	9.986427	53	9.404778	882	10.595222	10.013573	10.608794	45
16	9.391703	827	9.986395	53	9.405308	881	10.594692	10.013605	10.608297	44
17	9.392199	826	9.986363	53	9.405836	880	10.594164	10.013637	10.607801	43
18	9.392695	825	9.986331	53	9.406364	879	10.593636	10.013669	10.607305	42
19	9.393191	824	9.986299	55	9.406892	878	10.593108	10.013701	10.606810	41
20	9.393685	823	9.986266	53	9.407419	877	10.592581	10.013734	10.606315	40
21	9.394179	822	9.986234	53	9.407945	876	10.592055	10.013766	10.605821	39
22	9.394673	821	9.986202	55	9.408471	875	10.591529	10.013798	10.605327	38
23	9.395166	820	9.986169	53	9.408997	874	10.591003	10.013831	10.604834	37
24	9.395658	819	9.986137	55	9.409521	874	10.590479	10.013863	10.604342	36
25	9.396150	818	9.986104	53	9.410045	873	10.589955	10.013896	10.603850	35
26	9.396641	817	9.986072	55	9.410569	872	10.589431	10.013928	10.603359	34
27	9.397132	817	9.986039	53	9.411092	871	10.588908	10.013961	10.602868	33
28	9.397621	816	9.986007	55	9.411615	870	10.588385	10.013993	10.602379	32
29	9.398111	815	9.985974	53	9.412137	869	10.587863	10.014026	10.601889	31
30	9.398600	814	9.985942	55	9.412658	868	10.587342	10.014058	10.601400	30
31	9.399088	813	9.985909	55	9.413179	867	10.586821	10.014091	10.600912	29
32	9.399575	812	9.985876	55	9.413699	866	10.586301	10.014124	10.600425	28
33	9.400062	811	9.985843	53	9.414219	865	10.585781	10.014157	10.599938	27
34	9.400549	810	9.985811	55	9.414738	864	10.585262	10.014189	10.599451	26
35	9.401035	809	9.985778	55	9.415257	864	10.584743	10.014222	10.598965	25
36	9.401520	808	9.985745	55	9.415775	863	10.584225	10.014255	10.598480	24
37	9.402005	807	9.985712	55	9.416293	862	10.583707	10.014288	10.597995	23
38	9.402489	806	9.985679	55	9.416810	861	10.583190	10.014321	10.597511	22
39	9.402972	805	9.985646	55	9.417326	860	10.582674	10.014354	10.597028	21
40	9.403455	804	9.985613	55	9.417842	859	10.582158	10.014387	10.596545	20
41	9.403938	803	9.985580	55	9.418358	858	10.581642	10.014420	10.596062	19
42	9.404420	802	9.985547	55	9.418873	857	10.581127	10.014453	10.595580	18
43	9.404901	801	9.985514	57	9.419387	856	10.580613	10.014486	10.595099	17
44	9.405382	800	9.985480	55	9.419901	855	10.580099	10.014520	10.594618	16
45	9.405862	799	9.985447	55	9.420415	855	10.579585	10.014553	10.594138	15
46	9.406341	798	9.985414	55	9.420927	854	10.579073	10.014586	10.593659	14
47	9.406820	797	9.985381	57	9.421440	853	10.578560	10.014619	10.593180	13
48	9.407299	796	9.985347	55	9.421952	852	10.578048	10.014653	10.592701	12
49	9.407777	795	9.985314	57	9.422463	851	10.577537	10.014686	10.592223	11
50	9.408254	794	9.985280	55	9.422974	850	10.577026	10.014720	10.591746	10
51	9.408731	794	9.985247	57	9.423484	849	10.576516	10.014753	10.591269	9
52	9.409207	793	9.985213	55	9.423993	848	10.576007	10.014787	10.590793	8
53	9.409682	792	9.985180	57	9.424503	848	10.575497	10.014820	10.590318	7
54	9.410157	791	9.985146	55	9.425011	847	10.574989	10.014854	10.589843	6
55	9.410632	790	9.985113	57	9.425519	846	10.574481	10.014887	10.589368	5
56	9.411106	789	9.985079	57	9.426027	845	10.573973	10.014921	10.588894	4
57	9.411579	788	9.985045	57	9.426534	844	10.573466	10.014955	10.588421	3
58	9.412052	787	9.985011	55	9.427041	843	10.572959	10.014989	10.587948	2
59	9.412524	786	9.984978	57	9.427547	843	10.572453	10.015022	10.587476	1
60	9.412996		9.984944		9.428052		10.571948	10.015056	10.587004	0
M	Co-sine.		Sine.		Co-tang.		Tang.	Co-sec.	Secant.	M

75 Degrees.

TABLE XIX.

LOGARITHMIC SINES, TANGENTS, AND SECANTS.

15 Degrees.

M	Sine.	Diff.	Co-sine.	D.	Tang.	Diff.	Co-tang.	Secant.	Co-sec.	M
0	9.412996	785	9.984944	57	9.428052	842	10.571948	10.015056	10.587004	60
1	9.413467	784	9.984910	57	9.428557	841	10.571443	10.015090	10.586533	59
2	9.413938	783	9.984876	57	9.429062	840	10.570938	10.015124	10.586062	58
3	9.414408	783	9.984842	57	9.429566	839	10.570434	10.015158	10.585592	57
4	9.414878	782	9.984808	57	9.430070	838	10.569930	10.015192	10.585122	56
5	9.415347	781	9.984774	57	9.430573	838	10.569427	10.015226	10.584653	55
6	9.415815	780	9.984740	57	9.431075	837	10.568925	10.015260	10.584185	54
7	9.416283	779	9.984706	57	9.431577	836	10.568423	10.015294	10.583717	53
8	9.416751	778	9.984672	57	9.432079	835	10.567921	10.015328	10.583249	52
9	9.417217	777	9.984638	58	9.432580	834	10.567420	10.015362	10.582783	51
10	9.417684	776	9.984603	57	9.433080	833	10.566920	10.015397	10.582316	50
11	9.418150	775	9.984569	57	9.433580	832	10.566420	10.015431	10.581850	49
12	9.418615	774	9.984535	58	9.434080	832	10.565920	10.015465	10.581385	48
13	9.419079	773	9.984500	57	9.434579	831	10.565421	10.015500	10.580921	47
14	9.419544	773	9.984466	57	9.435078	830	10.564922	10.015534	10.580456	46
15	9.420007	772	9.984432	58	9.435576	829	10.564424	10.015568	10.579993	45
16	9.420470	771	9.984397	57	9.436073	828	10.563927	10.015603	10.579530	44
17	9.420933	770	9.984363	58	9.436570	828	10.563430	10.015637	10.579067	43
18	9.421395	769	9.984328	58	9.437067	827	10.562933	10.015672	10.578605	42
19	9.421857	768	9.984294	57	9.437563	826	10.562437	10.015706	10.578143	41
20	9.422318	767	9.984259	58	9.438059	825	10.561941	10.015741	10.577682	40
21	9.422778	767	9.984224	57	9.438554	824	10.561446	10.015776	10.577222	39
22	9.423238	766	9.984190	58	9.439048	823	10.560952	10.015810	10.576762	38
23	9.423697	765	9.984155	58	9.439543	823	10.560457	10.015845	10.576303	37
24	9.424156	764	9.984120	58	9.440036	822	10.559964	10.015880	10.575844	36
25	9.424615	763	9.984085	58	9.440529	821	10.559471	10.015915	10.575385	35
26	9.425073	762	9.984050	58	9.441022	820	10.558978	10.015950	10.574927	34
27	9.425530	761	9.984015	57	9.441514	819	10.558486	10.015985	10.574470	33
28	9.425987	760	9.983981	58	9.442006	819	10.557994	10.016019	10.574013	32
29	9.426443	760	9.983946	58	9.442497	818	10.557503	10.016054	10.573557	31
30	9.426899	759	9.983911	60	9.442988	817	10.557012	10.016089	10.573101	30
31	9.427354	758	9.983875	58	9.443479	816	10.556521	10.016125	10.572646	29
32	9.427809	757	9.983840	58	9.443968	816	10.556032	10.016160	10.572191	28
33	9.428263	756	9.983805	58	9.444458	815	10.555542	10.016195	10.571737	27
34	9.428717	755	9.983770	58	9.444947	814	10.555053	10.016230	10.571283	26
35	9.429170	754	9.983735	58	9.445435	813	10.554565	10.016265	10.570830	25
36	9.429623	753	9.983700	60	9.445923	812	10.554077	10.016300	10.570377	24
37	9.430075	752	9.983664	58	9.446411	812	10.553589	10.016336	10.569925	23
38	9.430527	752	9.983629	58	9.446898	811	10.553102	10.016371	10.569473	22
39	9.430978	751	9.983594	60	9.447384	810	10.552616	10.016406	10.569022	21
40	9.431429	750	9.983558	58	9.447870	809	10.552130	10.016442	10.568571	20
41	9.431879	749	9.983523	60	9.448356	809	10.551644	10.016477	10.568121	19
42	9.432329	749	9.983487	58	9.448841	808	10.551159	10.016513	10.567671	18
43	9.432778	748	9.983452	60	9.449326	807	10.550674	10.016548	10.567222	17
44	9.433226	747	9.983416	58	9.449810	806	10.550190	10.016584	10.566774	16
45	9.433675	746	9.983381	60	9.450294	806	10.549706	10.016619	10.566325	15
46	9.434122	745	9.983345	60	9.450777	805	10.549223	10.016655	10.565878	14
47	9.434569	744	9.983309	60	9.451260	804	10.548740	10.016691	10.565431	13
48	9.435016	744	9.983273	58	9.451743	803	10.548257	10.016727	10.564984	12
49	9.435462	743	9.983238	60	9.452225	802	10.547775	10.016762	10.564538	11
50	9.435908	742	9.983202	60	9.452706	802	10.547294	10.016798	10.564092	10
51	9.436353	741	9.983166	60	9.453187	801	10.546813	10.016834	10.563647	9
52	9.436798	740	9.983130	60	9.453668	800	10.546332	10.016870	10.563202	8
53	9.437242	740	9.983094	60	9.454148	799	10.545852	10.016906	10.562758	7
54	9.437686	739	9.983058	60	9.454628	799	10.545372	10.016942	10.562314	6
55	9.438129	738	9.983022	60	9.455107	798	10.544893	10.016978	10.561871	5
56	9.438572	737	9.982986	60	9.455586	797	10.544414	10.017014	10.561428	4
57	9.439014	736	9.982950	60	9.456064	796	10.543936	10.017050	10.560986	3
58	9.439456	736	9.982914	60	9.456542	796	10.543458	10.017086	10.560544	2
59	9.439897	735	9.982878	60	9.457019	795	10.542981	10.017122	10.560103	1
60	9.440338		9.982842		9.457496		10.542504	10.017158	10.559662	0
M	Co-sine.		Sine.		Co-tang.		Tang.	Co-sec.	Secant.	M

74 Degrees.

TABLE XIX.

LOGARITHMIC SINES TANGENTS AND SECANTS.

16 Degrees.

M	Sine.	Diff.	Co-sine.	D.	Tang.	Diff.	Co-tang.	Secant.	Co-sec.	M
0	9.440338	734	9.982842	62	9.457496	794	10.542504	10.017158	10.559662	60
1	9.440778	733	9.982805	60	9.457973	793	10.542027	10.017195	10.559222	59
2	9.441218	732	9.982769	60	9.458449	793	10.541551	10.017231	10.558782	58
3	9.441658	731	9.982733	62	9.458925	792	10.541075	10.017267	10.558342	57
4	9.442096	731	9.982696	60	9.459400	791	10.540600	10.017204	10.557904	56
5	9.442535	730	9.982660	60	9.459875	790	10.540125	10.017340	10.557465	55
6	9.442973	729	9.982624	62	9.460349	790	10.539651	10.017376	10.557027	54
7	9.443410	728	9.982587	60	9.460823	789	10.539177	10.017413	10.556590	53
8	9.443847	727	9.982551	62	9.461297	788	10.538703	10.017449	10.556153	52
9	9.444284	727	9.982514	62	9.461770	788	10.538230	10.017486	10.555716	51
10	9.444720	726	9.982477	60	9.462242	787	10.537758	10.017523	10.555280	50
11	9.445155	725	9.982441	62	9.462714	786	10.537286	10.017559	10.554845	49
12	9.445590	724	9.982404	62	9.463186	785	10.536814	10.017596	10.554410	48
13	9.446025	723	9.982367	60	9.463658	785	10.536342	10.017633	10.553975	47
14	9.446459	723	9.982331	62	9.464128	784	10.535872	10.017669	10.553541	46
15	9.446893	722	9.982294	62	9.464599	783	10.535401	10.017706	10.553107	45
16	9.447326	721	9.982257	62	9.465069	783	10.534931	10.017743	10.552674	44
17	9.447759	720	9.982220	62	9.465539	782	10.534461	10.017780	10.552241	43
18	9.448191	720	9.982183	62	9.466008	781	10.533992	10.017817	10.551809	42
19	9.448623	719	9.982146	62	9.466476	780	10.533524	10.017854	10.551377	41
20	9.449054	718	9.982109	62	9.466945	780	10.533055	10.017891	10.550946	40
21	9.449485	717	9.982072	62	9.467413	779	10.532587	10.017928	10.550515	39
22	9.449915	716	9.982035	62	9.467880	778	10.532120	10.017965	10.550085	38
23	9.450345	716	9.981998	62	9.468347	778	10.531653	10.018002	10.549655	37
24	9.450775	715	9.981961	62	9.468814	777	10.531186	10.018039	10.549225	36
25	9.451204	714	9.981924	63	9.469280	776	10.530720	10.018076	10.548796	35
26	9.451632	713	9.981886	62	9.469746	775	10.530254	10.018114	10.548368	34
27	9.452060	713	9.981849	62	9.470211	775	10.529789	10.018151	10.547940	33
28	9.452488	712	9.981812	63	9.470676	774	10.529324	10.018188	10.547512	32
29	9.452915	711	9.981774	62	9.471141	773	10.528859	10.018226	10.547085	31
30	9.453342	710	9.981737	62	9.471605	773	10.528395	10.018263	10.546658	30
31	9.453768	710	9.981700	63	9.472068	772	10.527932	10.018300	10.546232	29
32	9.454194	709	9.981662	62	9.472532	771	10.527468	10.018338	10.545806	28
33	9.454619	708	9.981625	63	9.472995	771	10.527005	10.018375	10.545381	27
34	9.455044	707	9.981587	63	9.473457	770	10.526543	10.018413	10.544956	26
35	9.455469	707	9.981549	62	9.473919	769	10.526081	10.018451	10.544531	25
36	9.455893	706	9.981512	63	9.474381	769	10.525619	10.018488	10.544107	24
37	9.456316	705	9.981474	63	9.474842	768	10.525158	10.018526	10.543684	23
38	9.456739	704	9.981436	62	9·475303	767	10.524697	10.018564	10.543261	22
39	9.457162	704	9.981399	63	9.475763	767	10.524237	10.018601	10.542838	21
40	9.457584	703	9.981361	63	9.476223	766	10.523777	10.018639	10.542416	20
41	9.458006	702	9.981323	63	9.476683	765	10.523317	10.018677	10.541994	19
42	9.458427	701	9.981285	63	9.477142	765	10.522858	10.018715	10.541573	18
43	9.458848	701	9.981247	63	9.477601	764	10.522399	10.018753	10.541152	17
44	9.459268	700	9.981209	63	9.478059	763	10.521941	10.018791	10.540732	16
45	9.459688	699	9.981171	63	9.478517	763	10.521483	10.018829	10.540312	15
46	9.460108	698	9.981133	63	9.478975	762	10.521025	10.018867	10.539892	14
47	9.460527	698	9.981095	63	9.479432	761	10.520568	10.018905	10.539473	13
48	9.460946	697	9.981057	63	9.479889	761	10.520111	10.018943	10.539054	12
49	9.461364	696	9.981019	63	9.480345	760	10.519655	10.018981	10.538630	11
50	9.461782	695	9.980981	65	9.480801	759	10.519199	10.019019	10.538218	10
51	9.462199	695	9.980942	63	9.481257	759	10.518743	10.019058	10.537801	9
52	9.462616	694	9.980904	63	9.481712	758	10.518288	10.019096	10.537384	8
53	9.463032	693	9.980866	65	9.482167	757	10.517833	10.019134	10.536968	7
54	9.463448	693	9.980827	63	9.482621	757	10.517379	10.019173	10.536552	6
55	9.463864	692	9.980789	65	9.483075	756	10.516925	10.019211	10.536136	5
56	9.464279	691	9.980750	62	9.483529	755	10.516471	10.019250	10.535721	4
57	9.464694	690	9.980712	65	9.483982	755	10.516018	10.019288	10.535306	3
58	9.465108	690	9.980673	63	9.484435	754	10.515565	10.019327	10.534892	2
59	9.465522	689	9.980635	65	9.484887	753	10.515113	10.019365	10.534478	1
60	9.465935		9.980596		9.485339		10.514661	10.019404	10.534065	0
M	Co-sine.		Sine.		Co-tang.		Tang.	Co-sec.	Secant.	M

73 Degrees.

TABLE XIX.

LOGARITHMIC SINES, TANGENTS, AND SECANTS.

17 Degrees.

M	Sine.	Diff.	Co-sine.	D.	Tang.	Diff.	Co-tang.	Secant.	Co-sec.	M
0	9.465935	688	9.980596	63	9.485339	753	10.514661	10.019404	10.534065	60
1	9.466348	688	9.980558	65	9.485791	752	10.514209	10.019442	10.533652	59
2	9.466761	687	9.980519	65	9.486242	751	10.513758	10.019481	10.533239	58
3	9.467173	686	9.980480	63	9.486693	751	10.513307	10.019520	10.532827	57
4	9.467585	685	9.980442	65	9.487143	750	10.512857	10.019558	10.532415	56
5	9.467996	685	9.980403	65	9.487593	749	10.512407	10.019597	10.532004	55
6	9.468407	684	9.980364	65	9.488043	749	10.511957	10.019636	10.531593	54
7	9.468817	683	9.980325	65	9.488492	748	10.511508	10.019675	10.531183	53
8	9.469227	683	9.980286	65	9.488941	747	10.511059	10.019714	10.530773	52
9	9.469637	682	9.980247	65	9.489390	747	10.510610	10.019753	10.530363	51
10	9.470046	681	9.980208	65	9.489838	746	10.510162	10.019792	10.529954	50
11	9.470455	680	9.980169	65	9.490286	746	10.509714	10.019831	10.529545	49
12	9.470863	680	9.980130	65	9.490733	745	10.509267	10.019870	10.529137	48
13	9.471271	679	9.980091	65	9.491180	744	10.508820	10.019909	10.528729	47
14	9.471679	678	9.980052	67	9.491627	744	10.508373	10.019948	10.528321	46
15	9.472086	678	9.980012	65	9.492073	743	10.507927	10.019988	10.527914	45
16	9.472492	677	9.979973	65	9.492519	743	10 507481	10.020027	10.527508	44
17	9.472898	676	9.979934	65	9.492965	742	10.507035	10.020066	10.527102	43
18	9.473304	676	9.979895	67	9.493410	741	10.506590	10.020105	10.526696	42
19	9.473710	675	9.979855	65	9.493854	740	10.506146	10.020145	10.526290	41
20	9.474115	674	9.979816	67	9.494299	740	10.505701	10.020184	10.525885	40
21	9.474519	674	9.979776	65	9.494743	739	10.505257	10.020224	10.525481	39
22	9.474923	673	9.979737	67	9.495186	739	10.504814	10.020263	10.525077	38
23	9.475327	672	9.979697	65	9.495630	738	10.504370	10.020303	10.524673	37
24	9.475730	672	9.979658	67	9.496073	737	10.503927	10.020342	10.524270	36
25	9.476133	671	9.979618	65	9.496515	737	10.503485	10.020382	10.523867	35
26	9.476536	670	9.979579	67	9.496957	736	10.503043	10.020421	10.523464	34
27	9.476938	669	9.979539	67	9.497399	736	10.502601	10.020461	10.523062	33
28	9.477340	669	9.979499	67	9.497841	735	10.502159	10.020501	10.522660	32
29	9.477741	668	9.979459	65	9.498282	734	10.501718	10.020541	10.522259	31
30	9.478142	667	9.979420	67	9.498722	734	10.501278	10.020580	10.521858	30
31	9.478542	667	9.979380	67	9.499163	733	10.500837	10.020620	10.521458	29
32	9.478942	666	9.979340	67	9.499603	733	10.500397	10.020660	10.521058	28
33	9.479342	665	9.979300	67	9.500042	732	10.499958	10.020700	10.520658	27
34	9.479741	665	9.979260	67	9.500481	731	10.499519	10.020740	10.520259	26
35	9.480140	664	9.979220	67	9.500920	731	10.499080	10.020780	10.519860	25
36	9.480539	663	9.979180	67	9.501359	730	10.498641	10.020820	10.519461	24
37	9.480937	663	9.979140	67	9.501797	730	10.498203	10.020860	10.519063	23
38	9.481334	662	9.979100	68	9.502235	729	10.497765	10.020900	10.518666	22
39	9.481731	661	9.979059	67	9.502672	728	10.497328	10.020941	10.518269	21
40	9.482128	661	9.979019	67	9.503109	728	10.496891	10.020981	10.517872	20
41	9.482525	660	9.978979	67	9.503546	727	10.496454	10.021021	10.517475	19
42	9.482921	659	9.978939	68	9.503982	727	10.496018	10.021061	10.517079	18
43	9.483316	659	9.978898	67	9.504418	726	10.495582	10.021102	10.516684	17
44	9.483712	658	9.978858	68	9.504854	725	10.495146	10.021142	10.516288	16
45	9.484107	657	9.978817	67	9.505289	725	10.494711	10.021183	10.515893	15
46	9.484501	657	9.978777	67	9.505724	724	10.494276	10.021223	10.515499	14
47	9.484895	656	9 978737	68	9.506159	724	10.493841	10.021263	10.515105	13
48	9.485289	655	9.978696	68	9.506593	723	10.493407	10.021304	10.514711	12
49	9.485682	655	9.978655	67	9.507027	722	10.492973	10.021345	10.514318	11
50	9.486075	654	9.978615	68	9.507460	722	10.492540	10.021385	10.513925	10
51	9.486467	653	9.978574	68	9.507893	721	10.492107	10.021426	10.513533	9
52	9.486860	653	9.978533	67	9 508326	721	10.491674	10.021467	10.513140	8
53	9.487251	652	9.978493	68	9.508759	720	10.491241	10.021507	10.512749	7
54	9.487643	651	9.978452	68	9.509191	719	10.490809	10.021548	10.512357	6
55	9.488034	651	9.978411	68	9.509622	719	10.490378	10.021589	10.511966	5
56	9.488424	650	9.978370	68	9.510054	718	10.489946	10.021630	10.511576	4
57	9.488814	650	9.978329	68	9.510485	718	10.489515	10.021671	10.511186	3
58	9.489204	649	9.978288	68	9.510916	717	10.489084	10.021712	10.510796	2
59	9.489593	648	9.978247	68	9.511346	717	10.488654	10.021753	10.510407	1
60	9.489982		9.978206		9.511776		10.488224	10.021794	10.510018	0
M	Co-sine.		Sine.		Co-tang.		Tang.	Co-sec.	Secant.	M

72 Degrees.

TABLE XIX.

LOGARITHMIC SINES, TANGENTS, AND SECANTS.

18 Degrees.

M	Sine.	Diff.	Co-sine.	D.	Tang.	Diff.	Co-tang.	Secant.	Co-sec.	M
0	9.489982	648	9.978206	68	9.511776	716	10.488224	10.021794	10.510018	60
1	9.490371	648	9.978165	68	9.512206	716	10.487794	10.021835	10.509629	59
2	9.490759	647	9.978124	68	9.512635	715	10.487365	10.021876	10.509241	58
3	9.491147	646	9.978083	69	9.513064	714	10.486936	10.021917	10.508853	57
4	9.491535	646	9.978042	69	9.513493	714	10.486507	10.021958	10.508465	56
5	9.491922	645	9.978001	69	9.513921	713	10.486079	10.021999	10.508078	55
6	9.492308	644	9.977959	69	9.514349	713	10.485651	10.022041	10.507692	54
7	9.492695	644	9.977918	69	9.514777	712	10.485223	10.022082	10.507305	53
8	9.493081	643	9.977877	69	9.515204	712	10.484796	10.022123	10.506919	52
9	9.493466	642	9.977835	69	9.515631	711	10.484469	10.022165	10.506534	51
10	9.493851	642	9.977794	69	9.516057	710	10.483943	10.022206	10.506149	50
11	9.494236	641	9.977752	69	9.516484	710	10.483516	10.022248	10.505764	49
12	9.494621	641	9.977711	69	9.516910	709	10.483090	10.022289	10.505379	48
13	9.495005	640	9.977669	69	9.517335	709	10.482665	10.022331	10.504995	47
14	9.495388	639	9.977628	69	9.517761	708	10.482239	10.022372	10.504612	46
15	9.495772	639	9.977586	69	9.518185	708	10.481815	10.022414	10.504228	45
16	9.496154	638	9.977544	70	9.518610	707	10.481390	10.022456	10.503846	44
17	9.496537	637	9.977503	70	9.519034	706	10.480966	10.022497	10.503463	43
18	9.496919	637	9.977461	70	9.519458	706	10.480542	10.022539	10.503081	42
19	9.497301	636	9.977419	70	9.519882	705	10.480118	10.022581	10.502699	41
20	9.497682	636	9.977377	70	9.520305	705	10.479695	10.022623	10.502318	40
21	9.498064	635	9.977335	70	9.520728	704	10.479272	10.022665	10.501936	39
22	9.498444	634	9.977293	70	9.521151	704	10.478849	10.022707	10.501556	38
23	9.498825	634	9.977251	70	9.521573	703	10.478427	10.022749	10.501175	37
24	9.499204	633	9.977209	70	9.521995	703	10.478005	10.022791	10.500796	36
25	9.499584	632	9.977167	70	9.522417	702	10.477583	10.022833	10.500416	35
26	9.499963	632	9.977125	70	9.522838	702	10.477162	10.022875	10.500037	34
27	9.500342	631	9.977083	70	9.523259	701	10.476741	10.022917	10.499658	33
28	9.500721	631	9.977041	70	9.523680	701	10.476320	10.022959	10.499279	32
29	9.501099	630	9.976999	70	9.524100	700	10.475900	10.023001	10.498901	31
30	9.501476	629	9.976957	70	9.524520	699	10.475480	10.023043	10.498524	30
31	9.501854	629	9.976914	70	9.524939	699	10.475061	10.023086	10.498146	29
32	9.502231	628	9.976872	70	9.525359	698	10.474641	10.023128	10.497769	28
33	9.502607	628	9.976830	71	9.525778	698	10.474222	10.023170	10.497393	27
34	9.502984	627	9.976787	71	9.526197	697	10.473803	10.023213	10.497016	26
35	9.503360	626	9.976745	71	9.526615	697	10.473385	10.023255	10.496640	25
36	9.503735	626	9.976702	71	9.527033	696	10.472967	10.023398	10.496265	24
37	9.504110	625	9.976660	71	9.527451	696	10.472549	10.023340	10.495890	23
38	9.504485	625	9.976617	71	9.527868	695	10.472132	10.023383	10.495515	22
39	9.504860	624	9.976574	71	9.528285	695	10.471715	10.023426	10.495140	21
40	9.505234	623	9.976532	71	9.528702	694	10.471298	10.023468	10.494766	20
41	9.505608	623	9.976489	71	9.529119	694	10.470881	10.023511	10.494392	19
42	9.505981	622	9.976446	71	9.529535	693	10.470465	10.023554	10.494019	18
43	9.506354	622	9.976404	71	9.529950	693	10.470050	10.023596	10.493646	17
44	9.506727	621	9.976361	71	9.530366	692	10.469634	10.023639	10.493273	16
45	9.507099	620	9.976318	71	9.530781	691	10.469219	10.023682	10.492901	15
46	9.507471	620	9.976275	71	9.531196	691	10.468804	10.023725	10.492529	14
47	9.507843	619	9.976232	72	9.531611	690	10.468389	10.023768	10.492157	13
48	9.508214	619	9.976189	72	9.532025	690	10.467975	10.023811	10.491786	12
49	9.508585	618	9.976146	72	9.532439	689	10.467561	10.023854	10.491415	11
50	9.508956	618	9.976103	72	9.532853	689	10.467147	10.023897	10.491044	10
51	9.509326	617	9.976060	72	9.533266	688	10.466734	10.023940	10.490674	9
52	9.509696	616	9.976017	72	9.533679	688	10.466321	10.023983	10.490304	8
53	9.510065	616	9.975974	72	9.534092	687	10.465908	10.024026	10.489935	7
54	9.510434	615	9.975930	72	9.534504	687	10.465496	10.024070	10.489566	6
55	9.510803	615	9.975887	72	9.534916	686	10.465084	10.024113	10.489197	5
56	9.511172	614	9.975844	72	9.535328	686	10.464672	10.024156	10.488828	4
57	9.511540	613	9.975800	72	9.535739	685	10.464261	10.024200	10.488460	3
58	9.511907	613	9.975757	72	9.536150	685	10.463850	10.024243	10.488093	2
59	9.512275	612	9.975714	72	9.536561	684	10.463439	10.024286	10.487725	1
60	9.512642		9.975670		9.536972		10.463028	10.024330	10.487358	0
M	Co-sine.		Sine.		Co-tang.		Tang.	Co-sec.	Secant.	M

71 Degrees.

TABLE XIX.

LOGARITHMIC SINES, TANGENTS, AND SECANTS.

19 Degrees.

M	Sine.	Diff.	Co-sine.	D.	Tang.	Diff.	Co-tang.	Secant.	Co-sec.	M
0	9.512642	612	9.975670	72	9.536972	684	10.463028	10.024330	10.487358	60
1	9.513009	611	9.975627	73	9.537382	683	10.462618	10.024373	10.486991	59
2	9.513375	611	9.975583	73	9.537792	683	10.462208	10.024417	10.486625	58
3	9.513741	610	9.975539	73	9.538202	682	10.461798	10.024461	10.486259	57
4	9.514107	609	9.975496	73	9.538611	682	10.461389	10.024504	10.485893	56
5	9.514472	609	9.975452	73	9.539020	681	10.460980	10.024548	10.485528	55
6	9.514837	608	9.975408	73	9.539429	681	10.460571	10.024592	10.485163	54
7	9.515202	608	9.975365	73	9.539837	680	10.460163	10.024635	10.484798	53
8	9.515566	607	9.975321	73	9.540245	680	10.459755	10.024679	10.484434	52
9	9.515930	607	9.975277	73	9.540653	679	10.459347	10.024723	10.484070	51
10	9.516294	606	9.975233	73	9.541061	679	10.458939	10.024767	10.483706	50
11	9.516657	605	9.975189	73	9.541468	678	10.458532	10.024811	10.483343	49
12	9.517020	605	9.975145	73	9.541875	678	10.458125	10.024855	10.482980	48
13	9.517382	604	9.975101	73	9.542281	677	10.457719	10.024899	10.482618	47
14	9.517745	604	9.975057	73	9.542688	677	10.457312	10.024943	10.482255	46
15	9.518107	603	9.975013	73	9.543094	676	10.456906	10.024987	10.481893	45
16	9.518468	603	9.974969	74	9.543499	676	10.456501	10.025031	10.481532	44
17	9.518829	602	9.974925	74	9.543905	675	10.456095	10.025075	10.481171	43
18	9.519190	601	9.974880	74	9.544310	675	10.455690	10.025120	10.480810	42
19	9.519551	601	9.974836	74	9.544715	674	10.455285	10.025164	10.480449	41
20	9.519911	600	9.974792	74	9.545119	674	10.454881	10.025208	10.480089	40
21	9.520271	600	9.974748	74	9.545524	673	10.454476	10.025252	10.479729	39
22	9.520631	599	9.974703	74	9.545928	673	10.454072	10.025297	10.479369	38
23	9.520990	599	9.974659	74	9.546331	672	10.453669	10.025341	10.479010	37
24	9.521349	598	9.974614	74	9.546735	672	10.453265	10.025386	10.478651	36
25	9.521707	598	9.974570	74	9.547138	671	10.452862	10.025430	10.478293	35
26	9.522066	597	9.974525	74	9.547540	671	10.452460	10.025475	10.477934	34
27	9.522424	596	9.974481	74	9.547943	670	10.452057	10.025519	10.477576	33
28	9.522781	596	9.974436	74	9.548345	670	10.451655	10.025564	10.477219	32
29	9.523138	595	9.974391	74	9.548747	669	10.451253	10.025609	10.476862	31
30	9.523495	595	9.974347	75	9.549149	669	10.450851	10.025653	10.476505	30
31	9.523852	594	9.974302	75	9.549550	668	10.450450	10.025698	10.476148	29
32	9.524208	594	9.974257	75	9.549951	668	10.450049	10.025743	10.475792	28
33	9.524564	593	9.974212	75	9.550352	667	10.449648	10.025788	10.475436	27
34	9.524920	593	9.974167	75	9.550752	667	10.449248	10.025833	10.475080	26
35	9.525275	592	9.974122	75	9.551152	666	10.448848	10.025878	10.474725	25
36	9.525630	591	9.974077	75	9.551552	666	10.448448	10.025923	10.474370	24
37	9.525984	591	9.974032	75	9.551952	665	10.448048	10.025968	10.474016	23
38	9.526339	590	9.973987	75	9.552351	665	10.447649	10.026013	10.473661	22
39	9.526693	590	9.973942	75	9.552750	665	10.447250	10.026058	10.473307	21
40	9.527046	589	9.973897	75	9.553149	664	10.446851	10.026103	10.472954	20
41	9.527400	589	9.973852	75	9.553548	664	10.446452	10.026148	10.472600	19
42	9.527753	588	9.973807	75	9.553946	663	10.446054	10.026193	10.472247	18
43	9.528105	588	9.973761	75	9.554344	663	10.445656	10.026239	10.471895	17
44	9.528458	587	9.973716	76	9.554741	662	10.445259	10.026284	10.471542	16
45	9.528810	587	9.973671	76	9.555139	662	10.444861	10.026329	10.471190	15
46	9.529161	586	9.973625	76	9.555536	661	10.444464	10.026375	10.470839	14
47	9.529513	586	9.973580	76	9.555933	661	10.444067	10.026420	10.470487	13
48	9.529864	585	9.973535	76	9.556329	660	10.443671	10.026465	10.470136	12
49	9.530215	585	9.973489	76	9.556725	660	10.443275	10.026511	10.469785	11
50	9.530565	584	9.973444	76	9.557121	659	10.442879	10.026556	10.469435	10
51	9.530915	584	9.973398	76	9.557517	659	10.442483	10.026602	10.469085	9
52	9.531265	583	9.973352	76	9.557913	659	10.442087	10.026648	10.468735	8
53	9.531614	582	9.973307	76	9.558308	658	10.441692	10.026693	10.468386	7
54	9.531963	582	9.973261	76	9.558702	658	10.441298	10.026739	10.468037	6
55	9.532312	581	9.973215	76	9.559097	657	10.440903	10.026785	10.467688	5
56	9.532661	581	9.973169	76	9.559491	657	10.440509	10.026831	10.467339	4
57	9.533009	580	9.973124	76	9.559885	656	10.440115	10.026876	10.466991	3
58	9.533357	580	9.973078	76	9.560279	656	10.439721	10.026922	10.466643	2
59	9.533704	579	9.973032	76	9.560673	655	10.439327	10.026968	10.466296	1
60	9.534052		9.972986		9.561066		10.438934	10.027014	10.465948	0
M	Co-sine.		Sine.		Co-tang.		Tang.	Co-sec.	Secant.	M

70 Degrees.

TABLE XIX.

LOGARITHMIC SINES, TANGENTS, AND SECANTS.

20 Degrees.

M	Sine.	Diff.	Co-sine.	D.	Tang.	Diff.	Co-tang.	Secant.	Co-sec.	M
0	9.534052	578	9.972986	77	9.561066	655	10.438934	10.027014	10.465948	60
1	9.534399	577	9.972940	77	9.561459	654	10.438541	10.027060	10.465601	59
2	9.534745	577	9.972891	77	9.561851	654	10.438149	10.027106	10.465255	58
3	9.535092	577	9.972848	77	9.562214	653	10.437756	10.027152	10.464908	57
4	9.535438	576	9.972802	78	9.562636	653	10.437364	10.027198	10.464562	56
5	9.535783	576	9.972755	77	9.563028	653	10.430972	10.027245	10.464217	55
6	9.536129	575	9.972709	77	9.563419	652	10.436581	10.027291	10.463871	54
7	9.536474	574	9.972663	77	9.563811	652	10.436189	10.027337	10.463526	53
8	9.536818	574	9.972617	78	9.564202	651	10.435798	10.027383	10.463182	52
9	9.537163	573	9.972570	77	9.564592	651	10.435408	10.027430	10.462837	51
10	9.537507	573	9.972524	77	9.564983	650	10.435017	10.027476	10.462493	50
11	9.537851	572	9.972478	78	9.565373	650	10.434627	10.027522	10.462149	49
12	9.538194	572	9.972431	77	9.565763	619	10.434237	10.027569	10.461806	48
13	9.538538	571	9.972385	78	9.566153	619	10.433847	10.027615	10.461462	47
14	9.538880	571	9.972338	78	9.566542	649	10.433158	10.027662	10.461120	46
15	9.539223	570	9.972291	77	9.566932	618	10.433068	10.027709	10.460777	45
16	9.539565	570	9.972245	78	9.567320	648	10.432680	10.027755	10.460435	44
17	9.539907	569	9.972198	78	9.567709	647	10.432291	10.027802	10.460093	43
18	9.540249	569	9.972151	77	9.568098	647	10.431902	10.027849	10.459751	42
19	9.540590	568	9.972105	78	9.568486	646	10.431514	10.027895	10.459410	41
20	9.540931	568	9.972058	78	9.568873	646	10.431127	10.027942	10.459069	40
21	9.541272	567	9.972011	78	9.569261	645	10.430739	10.027989	10.458728	39
22	9.541613	567	9.971964	78	9.569648	645	10.430352	10.028036	10.458387	38
23	9.541953	566	9.971917	78	9.570035	645	10.429965	10.028083	10.458047	37
24	9.542293	566	9.971870	78	9.570422	614	10.429578	10.028130	10.457707	36
25	9.542632	565	9.971823	78	9.570809	644	10.429191	10.028177	10.457368	35
26	9.542971	565	9.971776	78	9.571195	643	10.428805	10.028224	10.457029	34
27	9.543310	561	9.971729	78	9.571581	613	10.428419	10.028271	10.456690	33
28	9.543649	561	9.971682	78	9.571967	642	10.428033	10.028318	10.456351	32
29	9.543987	563	9.971635	78	9.572352	642	10.427648	10.028365	10.456013	31
30	9.544325	563	9.971588	80	9.572738	642	10.427262	10.028412	10.455675	30
31	9.544663	562	9.971540	78	9.573123	641	10.426877	10.028460	10.455337	29
32	9.545000	562	9.971493	78	9.573507	641	10.426493	10.028507	10.455000	28
33	9.545338	561	9.971446	80	9.573892	640	10.426108	10.028554	10.454662	27
34	9.545674	561	9.971398	78	9.574276	640	10.425724	10.028602	10.454326	26
35	9.546011	560	9.971351	80	9.574660	639	10.425340	10.028649	10.453989	25
36	9.546347	560	9.971303	78	9.575044	639	10.424956	10.028697	10.453653	24
37	9.546683	559	9.971256	80	9.575427	639	10.424573	10.028744	10.453317	23
38	9.517019	559	9.971208	78	9.575810	638	10.424190	10.028792	10.452981	22
39	9.547354	558	9.971161	80	9.576193	638	10.423807	10.028839	10.452646	21
40	9.547689	558	9.971113	78	9.576576	637	10.423424	10.028887	10.452311	20
41	9.548024	557	9.971066	80	9.576958	637	10.423042	10.028934	10.451976	19
42	9.548359	557	9.971018	80	9.577341	636	10.422659	10.028982	10.451641	18
43	9.548693	556	9.970970	80	9.577723	636	10.422277	10.029030	10.451307	17
44	9.549027	556	9.970922	80	9.578104	636	10.421896	10.029078	10.450973	16
45	9.549360	555	9.970874	78	9.578486	635	10.421514	10.029126	10.450640	15
46	9.549693	555	9.970827	80	9.578867	635	10.421133	10.029173	10.450307	14
47	9.550026	554	9.970779	80	9.579248	634	10.420752	10.029221	10.449974	13
48	9.550359	554	9.970731	80	9.579629	634	10.420371	10.029269	10.449641	12
49	9.550692	553	9.970683	80	9.580009	634	10.419991	10.029317	10.449308	11
50	9.551024	553	9.970635	82	9.580389	633	10.419611	10.029365	10.448976	10
51	9.551356	552	9.970586	80	9.580769	633	10.419231	10.029414	10.448644	9
52	9.551687	552	9.970538	80	9.581149	632	10.418851	10.029462	10.448313	8
53	9.552018	552	9.970490	80	9.581528	632	10.418472	10.029510	10.447982	7
54	9.552349	551	9.970442	80	9.581907	632	10.418093	10.029558	10.447651	6
55	9.552680	551	9.970394	82	9.582286	631	10.417714	10.029606	10.447320	5
56	9.553010	550	9.970345	80	9.582665	631	10.417335	10.029655	10.446990	4
57	9.553341	550	9.970297	80	9.583043	630	10.416957	10.029703	10.446659	3
58	9.553670	549	9.970249	82	9.583422	630	10.416578	10.029751	10.446330	2
59	9.554000	549	9.970200	80	9.583800	629	10.416200	10.029800	10.446000	1
60	9.554329		9.970152		9.584177		10.415823	10.029848	10.445671	0
M	Co-sine.		Sine.		Co-tang.		Tang.	Co-sec.	Secant.	M

69 Degrees.

TABLE XIX.

LOGARITHMIC SINES, TANGENTS, AND SECANTS.

21 Degrees.

M	Sine.	Diff.	Co-sine.	D.	Tang.	Diff.	Co-tang.	Secant.	Co-sec.	M
0	9.554329	548	9.970152	81	9.584177	629	10.415823	10.029848	10.445671	60
1	9.554658	548	9.970103	81	9.584555	629	10.415445	10.029897	10.445342	59
2	9.554987	547	9.970055	81	9.584932	628	10.415068	10.029945	10.445013	58
3	9.555315	547	9.970006	81	9.585309	628	10.414691	10.029994	10.444685	57
4	9.555643	546	9.969957	81	9.585686	627	10.414314	10.030043	10.444357	56
5	9.555971	546	9.969909	81	9.586062	627	10.413938	10.030091	10.444029	55
6	9.556299	545	9.969860	81	9.586439	627	10.413561	10.030140	10.443701	54
7	9.556626	645	9.969811	81	9.586815	626	10.413185	10.030189	10.443374	53
8	9.556953	544	9.969762	81	9.587190	626	10.412810	10.030238	10.443047	52
9	9.557280	544	9.969714	81	9.587566	625	10.412434	10.030286	10.442720	51
10	9.557606	543	9.969665	81	9.587941	625	10.412059	10.030335	10.442394	50
11	9.557932	543	9.969616	82	9.588316	625	10.411684	10.030384	10.442068	49
12	9.558258	543	9.969567	82	9.588691	624	10.411309	10.030433	10.441742	48
13	9.558583	542	9.969518	82	9.589066	624	10.410934	10.030482	10.441417	47
14	9.558909	542	9.969469	82	9.589440	623	10.410560	10.030531	10.441091	46
15	9.559234	541	9.969420	82	9.589814	623	10.410186	10.030580	10.440766	45
16	9.559558	541	9.969370	82	9.590188	623	10.409812	10.030630	10.440442	44
17	9.559883	540	9.969321	82	9.590562	622	10.409438	10.030679	10.440117	43
18	9.560207	540	9.969272	82	9.590935	622	10.409065	10.030728	10.439793	42
19	9.560531	539	9.969223	82	9.591308	622	10.408692	10.030777	10.439469	41
20	9.560855	539	9.969173	82	9.591681	621	10.408319	10.030827	10.439145	40
21	9.561178	538	9.969124	82	9.592054	621	10.407946	10.030876	10.438822	39
22	9.561501	538	9.969075	82	9.592426	620	10.407574	10.030925	10.438499	38
23	9.561824	537	9.969025	82	9.592798	620	10.407202	10.030975	10.438176	37
24	9.562146	537	9.968976	82	9.593171	620	10.406829	10.031024	10.437854	36
25	9.562468	536	9.968926	83	9.593542	619	10.406458	10.031074	10.437532	35
26	9.562790	536	9.968877	83	9.593914	619	10.406086	10.031123	10.437210	34
27	9.563112	536	9.968827	83	9.594285	618	10.405715	10.031173	10.436888	33
28	9.563433	535	9.968777	83	9.594656	618	10.405344	10.031223	10.436567	32
29	9.563755	535	9.968728	83	9.595027	618	10.404973	10.031272	10.436245	31
30	9.564075	534	9.968678	83	9.595398	617	10.404602	10.031322	10.435925	30
31	9.564396	534	9.968628	83	9.595768	617	10.404232	10.031372	10.435604	29
32	9.564716	533	9.968578	83	9.596138	616	10.403862	10.031422	10.435284	28
33	9.565036	533	9.968528	83	9.596508	616	10.403492	10.031472	10.434964	27
34	9.565356	532	9.968479	83	9.596878	616	10.403122	10.031521	10.434644	26
35	9.565676	532	9.968429	83	9.597247	615	10.402753	10.031571	10.434324	25
36	9.565995	531	9.968379	83	9.597616	615	10.402384	10.031621	10.434005	24
37	9.566314	531	9.968329	83	9.597985	615	10.402015	10.031671	10.433686	23
38	9.566632	531	9.968278	83	9.598354	614	10.401646	10.031722	10.433368	22
39	9.566951	530	9.968228	84	9.598722	614	10.401278	10.031772	10.433049	21
40	9.567269	530	9.968178	84	9.599091	613	10.400909	10.031822	10.432731	20
41	9.567587	529	9.968128	84	9.599459	613	10.400541	10.031872	10.432413	19
42	9.567904	529	9.968078	84	9.599827	613	10.400173	10.031922	10.432096	18
43	9.568222	528	9.968027	84	9.600194	612	10.399806	10.031973	10.431778	17
44	9.568539	528	9.967977	84	9.600562	612	10.399438	10.032023	10.431461	16
45	9.568856	528	9.967927	84	9.600929	611	10.399071	10.032073	10.431144	15
46	9.569172	527	9.967876	84	9.601296	611	10.398704	10.032124	10.430828	14
47	9.569488	527	9.967826	84	9.601662	611	10.398338	10.032174	10.430512	13
48	9.569804	526	9.967775	84	9.602029	610	10.397971	10.032225	10.430196	12
49	9.570120	526	9.967725	84	9.602395	610	10.397605	10.032275	10.429880	11
50	9.570435	525	9.967674	84	9.602761	610	10.397239	10.032326	10.429565	10
51	9.570751	525	9.967624	84	9.603127	609	10.396873	10.032376	10.429249	9
52	9.571066	524	9.967573	84	9.603493	609	10.396507	10.032427	10.428934	8
53	9.571380	524	9.967522	85	9.603858	609	10.396142	10.032478	10.428620	7
54	9.571695	523	9.967471	85	9.604223	608	10.395777	10.032529	10.428305	6
55	9.572009	523	9.967421	85	9.604588	608	10.395412	10.032579	10.427991	5
56	9.572323	523	9.967370	85	9.604953	607	10.395047	10.032630	10.427677	4
57	9.572636	522	9.967319	85	9.605317	607	10.394683	10.032681	10.427364	3
58	9.572950	522	9.967268	85	9.605682	607	10.394318	10.032732	10.427050	2
59	9.573263	521	9.967217	85	9.606046	606	10.393954	10.032783	10.426737	1
60	9.573575		9.967166		9.606410		10.393590	10.032834	10.426425	0
M	Co-sine.		Sine.		Co-tang.		Tang.	Co-sec.	Secant.	M

68 Degrees.

TABLE XIX.

LOGARITHMIC SINES, TANGENTS, AND SECANTS.

22 Degrees.

M	Sine.	Diff.	Co-sine.	D.	Tang.	Diff.	Co-tang	Secant.	Co-sec.	M
0	9.573575	521	9.967166	85	9.606410	606	10.393590	10.032834	10.426425	60
1	9.573888	520	9.967115	85	9.606773	606	10.393227	10.032885	10.426112	59
2	9.574200	520	9.967064	85	9.607137	605	10.392863	10.032936	10.425800	58
3	9.574512	519	9.967013	85	9.607500	605	10.392500	10.032987	10.425488	57
4	9.574824	519	9.966961	85	9.607863	604	10.392137	10.033039	10.425176	56
5	9.575136	519	9.966910	85	9.608225	604	10.391775	10.033090	10.424864	55
6	9.575447	518	9.966859	85	9.608588	604	10.391412	10.033141	10.424553	54
7	9.575758	518	9.966808	85	9.608950	603	10.391050	10.033192	10.424242	53
8	9.576069	517	9.966756	86	9.609312	603	10.390688	10.033244	10.423931	52
9	9.576379	517	9.966705	86	9.609674	603	10.390326	10.033295	10.423621	51
10	9.576689	516	9.966653	86	9.610036	602	10.389964	10.033347	10.423311	50
11	9.576999	516	9.966602	86	9.610397	602	10.389603	10.033398	10.423001	49
12	9.577309	516	9.966550	86	9.610759	602	10.389241	10.033450	10.422691	48
13	9.577618	515	9.966499	86	9.611120	601	10.388880	10.033501	10.422382	47
14	9.577927	515	9.966447	86	9.611480	601	10.388520	10.033553	10.422073	46
15	9.578236	514	9.966395	86	9.611841	601	10.388159	10.033605	10.421764	45
16	9.578545	514	9.966344	86	9.612201	600	10.387799	10.033656	10.421455	44
17	9.578853	513	9.966292	86	9.612561	600	10.387439	10.033708	10.421147	43
18	9.579162	513	9.966240	86	9.612921	600	10.387079	10.033760	10.420838	42
19	9.579470	513	9.966188	86	9.613281	599	10.386719	10.033812	10.420530	41
20	9.579777	512	9.966136	86	9.613641	599	10.386359	10.033864	10.420223	40
21	9.580085	512	9.966085	87	9.614000	598	10.386000	10.033915	10.419915	39
22	9.580392	511	9.966033	87	9.614359	598	10.385641	10.033967	10.419608	38
23	9.580699	511	9·965981	87	9.614718	598	10.385282	10.034019	10.419301	37
24	9.581005	511	9.965929	87	9.615077	597	10.384923	10.034071	10.418995	36
25	9.581312	510	9.965876	87	9.615435	597	10.384565	10.034124	10.418688	35
26	9.581618	510	9.965824	87	9.615793	597	10.384207	10.034176	10.418382	34
27	9.581924	509	9.965772	87	9.616151	596	10.383849	10.034228	10.418076	33
28	9.582229	509	9.965720	87	9.616509	596	10.383491	10.034280	10.417771	32
29	9.582535	509	9.965668	87	9.616867	596	10.383133	10.034332	10.417465	31
30	9.582840	508	9.965615	87	9.617224	595	10.382776	10.034385	10.417160	30
31	9.583145	508	9.965563	87	9.617582	595	10.382418	10.034437	10.416855	29
32	9.583449	507	9.965511	87	9.617939	595	10.382061	10.034489	10.416551	28
33	9.583754	507	9.965458	87	9.618295	594	10.381705	10.034542	10.416246	27
34	9.584058	506	9.965406	87	9.618652	594	10.381348	10.034594	10.415942	26
35	9.584361	506	9.965353	88	9.619008	594	10.380992	10.034647	10.415639	25
36	9.584665	506	9.965301	88	9.619364	593	10.380636	10.034699	10.415335	24
37	9.584968	505	9.965248	88	9.619721	593	10.380279	10.034752	10.415032	23
38	9.585272	505	9.965195	88	9.620076	593	10.379924	10.034805	10.414728	22
39	9.585574	504	9.965143	88	9.620432	592	10.379568	10.034857	10.414426	21
40	9.585877	504	9.965090	88	9.620787	592	10.379213	10.034910	10.414123	20
41	9.586179	503	9.965037	88	9.621142	592	10.378858	10.034963	10.413821	19
42	9.586482	503	9.964984	88	9.621497	591	10.378503	10.035016	10.413518	18
43	9.586783	503	9.964931	88	9.621852	591	10.378148	10.035069	10.413217	17
44	9.587085	502	9.964879	88	9.622207	590	10.377793	10.035121	10.412915	16
45	9.587386	502	9.964826	88	9.622561	590	10.377439	10.035174	10.412614	15
46	9.587688	501	9.964773	88	9.622915	590	10.377085	10.035227	10.412312	14
47	9.587989	501	9.964720	88	9.623269	589	10.376731	10.035280	10.412011	13
48	9.588289	501	9.964666	89	9.623623	589	10.376377	10.035334	10.411711	12
49	9.588590	500	9.964613	89	9.623976	589	10.376024	10.035387	10.411410	11
50	9.588890	500	9.964560	89	9.624330	588	10.375670	10.035440	10.411110	10
51	9.589190	499	9.964507	89	9.624683	588	10.375317	10.035493	10.410810	9
52	9.589489	499	9.964454	89	9.625036	588	10.374964	10.035546	10.410511	8
53	9.589789	499	9.964400	89	9.625388	587	10.374612	10.035600	10.410211	7
54	9.590088	498	9.964347	89	9.625741	587	10.374259	10.035653	10.409912	6
55	9.590387	498	9.964294	89	9.626093	587	10.373907	10.035706	10.409613	5
56	9.590686	497	9.964240	89	9.626445	586	10.373555	10.035670	10.409314	4
57	9.590984	497	9.964187	89	9.626797	586	10.373203	10.035813	10.409016	3
58	9.591282	497	9.964133	89	9.627149	586	10.372851	10.035867	10.408718	2
59	9.591580	496	9.964080	89	9.627501	585	10.372499	10.035920	10.408420	1
60	9.591878		9.964026		9.627852		10.372148	10.035974	10.408122	0
M	Co-sine.		Sine.		Co-tang.		Tang.	Co-sec.	Secant.	M

67 Degrees.

TABLE XIX.

LOGARITHMIC SINES, TANGENTS, AND SECANTS.

23 Degrees.

M	Sine.	Diff.	Co-sine.	D.	Tang.	Diff.	Co-tang.	Secant.	Co-sec.	M
0	9.591878	496	9.964026	89	9.627852	585	10.372148	10.035974	10.408122	60
1	9.592176	495	9.963972	89	9.628203	585	10.371797	10.036028	10.407824	59
2	9.592473	495	9.963919	89	9.628554	585	10.371446	10.036081	10.407527	58
3	9.592770	495	9.963865	90	9.628905	584	10.371095	10.036135	10.407230	57
4	9.593067	494	9.963811	90	9.629255	584	10.370745	10.036189	10.406933	56
5	9.593363	494	9.963757	90	9.629606	593	10.370394	10.036243	10.406637	55
6	9.593659	493	9.963704	90	9.629956	583	10.370044	10.036296	10.406341	54
7	9.593955	493	9.963650	90	9.630306	583	10.369694	10.036350	10.406045	53
8	9.594251	493	9.963596	90	9.630656	583	10.369344	10.036404	10.405749	52
9	9.594547	492	9.963542	90	9.631005	582	10.368995	10.036458	10.405453	51
10	9.594842	492	9.963488	90	9.631355	582	10.368645	10.036512	10.405158	50
11	9.595137	491	9.963434	90	9.631704	582	10.368296	10.036566	10.404863	49
12	9.595432	491	9.963379	90	9.632053	581	10.367947	10.036621	10.404568	48
13	9.595727	491	9.963325	90	9.632401	581	10.367599	10.036675	10.404273	47
14	9.596021	490	9.963271	90	9.632750	581	10.367250	10.036729	10.403979	46
15	9.596315	490	9.963217	90	9.633098	580	10.366902	10.036783	10.403685	45
16	9.596609	489	9.963163	90	9.633447	580	10.366553	10.036837	10.403391	44
17	9.596903	489	9.963108	91	9.633795	580	10.366205	10.036892	10.403097	43
18	9.597196	489	9.963054	91	9.634143	579	10.365857	10.036946	10.402804	42
19	9.597490	488	9.962999	91	9.634490	579	10.365510	10.037001	10.402510	41
20	9.597783	488	9.962945	91	9.634838	579	10.365162	10.037055	10.402217	40
21	9.598075	487	9.962890	91	9.635185	578	10.364815	10.037110	10.401925	39
22	9.598368	487	9.962836	91	9.635532	578	10.364468	10.037164	10.401632	38
23	9.598660	487	9.962781	91	9.635879	578	10.364121	10.037219	10.401340	37
24	9.598952	486	9.962727	91	9.636226	577	10.363774	10.037273	10.401048	36
25	9.599244	486	9.962672	91	9.636572	577	10.363428	10.037328	10.400756	35
26	9.599536	485	9.962617	91	9.636919	577	10.363081	10.037383	10.400464	34
27	9.599827	485	9.962562	91	9.637265	577	10.362735	10.037438	10.400173	33
28	9.600118	485	9.962508	91	9.637611	576	10.362389	10.037492	10.399882	32
29	9.600409	484	9.962453	91	9.637956	576	10.362044	10.037547	10.399591	31
30	9.600700	484	9.962398	92	9.638302	576	10.361698	10.037602	10.399300	30
31	9.600990	484	9.962343	92	9.638647	575	10.361353	10.037657	10.399010	29
32	9.601280	483	9.962288	92	9.638992	575	10.361008	10.037712	10.398720	28
33	9.601570	483	9.962233	92	9.639337	575	10.360663	10.037767	10.398430	27
34	9.601860	482	9.962178	92	9.639682	574	10.360318	10.037822	10.398140	26
35	9.602150	482	9.962123	92	9.640027	574	10.359973	10.037877	10.397850	25
36	9.602439	482	9.962067	92	9.640371	574	10.359629	10.037933	10.397561	24
37	9 602728	481	9.962012	92	9.640716	573	10.359284	10.037988	10.397272	23
38	9.603017	481	9.961957	92	9.641060	573	10.358940	10.038043	10.396983	22
39	9.603305	481	9.961902	92	9.641404	573	10.358596	10.038098	10.396695	21
40	9.603594	480	9.961846	92	9.641747	572	10.358253	10.038154	10.396406	20
41	9.603882	480	9.961791	92	9.642091	572	10.357909	10.038209	10.396118	19
42	9.604170	479	9.961735	92	9.642434	572	10.357566	10.038265	10.395830	18
43	9.604457	479	9.961680	92	9.642777	572	10.357223	10.038320	10.395543	17
44	9.604745	479	9.961624	93	9.643120	571	10.356880	10.038376	10.395255	16
45	9.605032	478	9.961569	93	9.643463	571	10.356537	10.038431	10.394968	15
46	9.605319	478	9.961513	93	9.643806	571	10.356194	10.038487	10.394681	14
47	9.605606	478	9.961458	93	9.644148	570	10.355852	10.038542	10.394394	13
48	9.605892	477	9.961402	93	9.644490	570	10.355510	10.038598	10.394108	12
49	9.606179	477	9.961346	93	9.644832	570	10.355168	10.038654	10.393821	11
50	9.606465	476	9.961290	93	9.645174	570	10.354826	10.038710	10.393535	10
51	9.606751	476	9.961235	93	9.645516	569	10.354484	10.038765	10.393249	9
52	9.607036	476	9.961179	93	9.645857	569	10.354143	10.038821	10.392964	8
53	9.607322	475	9.961123	93	9.646199	569	10.353801	10.038877	10.392678	7
54	9.607607	475	9.961067	93	9.646540	568	10.353460	10.038933	10.392393	6
55	9.607892	474	9.961011	93	9.646881	568	10.353119	10.038989	10.392108	5
56	9.608177	474	9.960955	93	9.647222	568	10.352778	10.039045	10.391823	4
57	9.608461	474	9.960899	93	9.647562	567	10.352438	10.039101	10.391539	3
58	9.608745	473	9.960843	94	9.647903	567	10.352097	10.039157	10.391255	2
59	9.609029	473	9.960786	94	9.648243	567	10.351757	10.039214	10.390971	1
60	9.609313		9.960730		9.648583		10.351417	10.039270	10.390687	0
M	Co-sine.		Sine.		Co-tang.		Tang.	Co-sec.	Secant.	M

66 Degrees.

TABLE XIX.

LOGARITHMIC SINES, TANGENTS, AND SECANTS.

24 Degrees.

M	Sine.	Diff.	Co-sine.	D.	Tang.	Diff.	Co-tang.	Secant.	Co-sec.	M
0	9.609313	473	9.960730	94	9.648583	566	10.351417	10.039270	10.390687	60
1	9.609597	472	9.960674	94	9.648923	566	10.351077	10.039326	10.390403	59
2	9.609880	472	9.960618	94	9.649263	566	10.350737	10.039382	10.390120	58
3	9.610164	472	9.960561	94	9.649602	566	10.350398	10.039439	10.389836	57
4	9.610447	471	9.960505	94	9.649942	565	10.350058	10.039495	10.389553	56
5	9.610729	471	9.960448	94	9.650281	565	10.349719	10.039552	10.389271	55
6	9.611012	470	9.960392	94	9.650620	565	10.349380	10.039608	10.388988	54
7	9.611294	470	9.960335	94	9.650959	564	10.349041	10.039665	10.388706	53
8	9.611576	470	9.960279	94	9.651297	564	10.348703	10.039721	10.388424	52
9	9.611858	469	9.960222	94	9.651636	564	10.348364	10.039778	10.388142	51
10	9.612140	469	9.960165	94	9.651974	563	10.348026	10.039835	10.387860	50
11	9.612421	469	9.960109	95	9.652312	563	10.347688	10.039891	10.387579	49
12	9.612702	468	9.960052	95	9.652650	563	10.347350	10.039948	10.387298	48
13	9.612983	468	9.959995	95	9.652988	563	10.347012	10.040005	10.387017	47
14	9.613264	467	9.959938	95	9.653326	562	10.346674	10.040062	10.386736	46
15	9.613545	467	9.959882	95	9.653663	562	10.346337	10.040118	10.386455	45
16	9.613825	467	9.959825	95	9.654000	562	10.346000	10.040175	10.386175	44
17	9.614105	466	9.959768	95	9.654337	561	10.345663	10.040232	10.385895	43
18	9.614385	466	9.959711	95	9.654674	561	10.345326	10.040289	10.385615	42
19	9.614665	466	9.959654	95	9.655011	561	10.344989	10.040346	10.385335	41
20	9.614944	465	9.959596	95	9.655348	561	10.344652	10.040404	10.385056	40
21	9.615223	465	9.959539	95	9.655684	560	10.344316	10.040461	10.384777	39
22	9.615502	465	9.959482	95	9.656020	560	10.343980	10.040518	10.384498	38
23	9.615781	464	9.959425	95	9.656356	560	10.343644	10.040575	10.384219	37
24	9.616060	464	9.959368	95	9.656692	559	10.343308	10.040632	10.383940	36
25	9.616338	464	9.959310	96	9.657028	559	10.342972	10.040690	10.383662	35
26	9.616616	463	9.959253	96	9.657364	559	10.342636	10.040747	10.383384	34
27	9.616894	463	9.959195	96	9.657699	559	10.342301	10.040805	10.383106	33
28	9.617172	462	9.959138	96	9.658034	558	10.341966	10.040862	10.382828	32
29	9.617450	462	9.959080	96	9.658369	558	10.341631	10.040919	10.382550	31
30	9.617727	462	9.959023	96	9.658704	558	10.341296	10.040977	10.382273	30
31	9.618004	461	9.958965	96	9.659039	558	10·340961	10.041035	10.381996	29
32	9.618281	461	9.958908	96	9.659373	557	10.340627	10.041092	10.381719	28
33	9.618558	461	9.958850	96	9.659708	557	10.340292	10.041150	10.381442	27
34	9.618834	460	9.958792	96	9.660042	557	10.339958	10.041208	10.381166	26
35	9.619110	460	9.958734	96	9.660376	556	10.339624	10.041266	10.380890	25
36	9.619386	460	9.958677	96	9.660710	556	10.339290	10.041323	10.380614	24
37	9.619662	459	9.958619	96	9.661043	556	10.338957	10.041381	10.380338	23
38	9.619938	459	9.958561	96	9.661377	556	10.338623	10.041439	10.380062	22
39	9.620213	459	9.958503	97	9.661710	555	10.338290	10.041497	10.379787	21
40	9.620488	458	9.958445	97	9.662043	555	10.337957	10.041555	10.379512	20
41	9.620763	458	9.958387	97	9.662376	555	10.337624	10.041613	10.379237	19
42	9.621038	457	9.958329	97	9.662709	554	10.337291	10.041671	10.378962	18
43	9.621313	457	9.958271	97	9.663042	554	10.336958	10.041729	10.378687	17
44	9.621587	457	9.958213	97	9.663375	554	10.336625	10.041787	10.378413	16
45	9.621861	456	9.958154	97	9.663707	554	10.336293	10.041846	10.378139	15
46	9.622135	456	9.958096	97	9.664039	553	10.335961	10.041904	10.377865	14
47	9.622409	456	9.958038	97	9.664371	553	10.335629	10.041962	10.377591	13
48	9.622682	455	9.957979	97	9.664703	553	10.335297	10.042021	10.377318	12
49	9.622956	455	9.957921	97	9.665035	553	10.334965	10.042079	10.377044	11
50	9.623229	455	9.957863	97	9.665366	552	10.334634	10.042137	10.376771	10
51	9.623502	454	9.957804	97	9.665697	552	10.334303	10.042196	10.376498	9
52	9.623774	454	9.957746	98	9.666029	552	10.333971	10.042254	10.376226	8
53	9.624047	454	9.957687	98	9.666360	551	10.333640	10.042313	10.375953	7
54	9.624319	453	9.957628	98	9.666691	551	10.333309	10.042372	10.375681	6
55	9.624591	453	9.957570	98	9.667021	551	10.332979	10.042430	10.375409	5
56	9.624863	453	9.957511	98	9.667352	551	10.332148	10.042489	10.375137	4
57	9.625135	452	9.957452	98	9.667682	550	10.332318	10.042548	10.374865	3
58	9.625406	452	9.957393	98	9.668013	550	10.331987	10.042607	10.374594	2
59	9.625677	452	9.957335	98	9.668343	550	10.331657	10.042665	10.374323	1
60	9.625948		9.957276		9.668672		10.331328	10.042724	10.374052	0
M	Co-sine.		Sine.		Co-tang.		Tang.	Co-sec.	Secant.	M

65 Degrees.

TABLE XIX.

LOGARITHMIC SINES, TANGENTS, AND SECANTS.

25 Degrees.

M	Sine.	Diff.	Co-sine.	D.	Tang.	Diff.	Co-tang.	Secant.	Co-sec.	M
0	9.625948	451	9.957276	98	9.668672	550	10.331328	10.042724	10.374052	60
1	9.626219	451	9.957217	98	9.669002	549	10.330998	10.042783	10.373781	59
2	9.626490	451	9.957158	98	9.669332	549	10.330668	10.042842	10.373510	58
3	9.626760	450	9.957099	98	9.669661	549	10.330339	10.042901	10.373240	57
4	9.627030	450	9.957040	98	9.669991	548	10.330009	10.042960	10.372970	56
5	9.627300	450	9.956981	98	9.670320	548	10.329680	10.043019	10.372700	55
6	9.627570	449	9.956921	99	9.670649	548	10.329351	10.043079	10.372430	54
7	9.627840	449	9.956862	99	9.670977	548	10.329023	10.043138	10.372160	53
8	9.628109	449	9.956803	99	9.671306	547	10.328694	10.043197	10.371891	52
9	9.628378	448	9.956744	99	9.671634	547	10.328366	10.043256	10.371622	51
10	9.628647	448	9.956684	99	9.671963	547	10.328037	10.043316	10.371353	50
11	9.628916	448	9.956625	99	9.672291	547	10.327709	10.043375	10.371084	49
12	9.629185	447	9.956566	99	9.672619	546	10.327381	10.043434	10.370815	48
13	9.629453	447	9.956506	99	9.672947	546	10.327053	10.043494	10.370547	47
14	9.629721	447	9.956447	99	9.673274	546	10.326726	10.043553	10 370279	46
15	9.629989	446	9.956387	99	9.673602	546	10.326398	10.043613	10.370011	45
16	9.630257	446	9.956327	99	9.673929	545	10.326071	10.043673	10.369743	44
17	9.630524	446	9.956268	99	9.674257	545	10.325743	10.043732	10.369476	43
18	9.630792	445	9.956208	100	9.674584	545	10.325416	10.043792	10.369208	42
19	9.631059	445	9.956148	100	9.674910	544	10.325090	10.043852	10.368941	41
20	9.631326	445	9.956089	100	9.675237	544	10.324763	10.043911	10.368674	40
21	9.631593	444	9.956029	100	9.675564	544	10.324436	10.043971	10.368407	39
22	9.631859	444	9.955969	100	9.675890	544	10.324110	10.044031	10.368141	38
23	9.632125	444	9.955909	100	9.676217	543	10.323783	10.044091	10.367875	37
24	9.632392	443	9.955849	100	9.676543	543	10.323457	10.044151	10.367608	36
25	9.632658	443	9.955789	100	9.676869	543	10.323131	10.044211	10.367342	35
26	9.632923	443	9.955729	100	9.677194	543	10.322806	10.044271	10.367077	34
27	9.633189	442	9.955669	100	9.677520	542	10·322480	10.044331	10.366811	33
28	9.633454	442	9.955609	100	9.677846	542	10.322154	10.044391	10.366546	32
29	9.633719	442	9.955548	100	9.678171	542	10.321829	10.044452	10.366281	31
30	9.633984	441	9.955488	100	9.678496	542	10.321504	10.044512	10.366016	30
31	9.634249	441	9.955428	101	9.678821	541	10.321179	10.044572	10.365751	29
32	9.634514	440	9.955368	101	9.679146	541	10.320854	10.044632	10.365486	28
33	9.634778	440	9.955307	101	9.679471	541	10.320529	10.044693	10.365222	27
34	9.635042	440	9.955247	101	9.679795	541	10.320205	10.044753	10.364958	26
35	9.635306	439	9.955186	101	9.680120	540	10.319880	10.044814	10.364694	25
36	9.635570	439	9.955126	101	9.680444	540	10.319556	10.044874	10.364430	24
37	9.635834	439	9.955065	101	9.680768	540	10.319232	10.044935	10.364166	23
38	9.636097	438	9.955005	101	9.681092	540	10.318908	10.044995	10.363903	22
39	9.636360	438	9.954944	101	9.681416	539	10.318584	10.045056	10.363640	21
40	9.636623	438	9.954883	101	9.681740	539	10.318260	10.045117	10.363377	20
41	9.636886	437	9.954823	101	9.682063	539	10.317937	10.045177	10.363114	19
42	9.637148	437	9.954762	101	9.682387	539	10.317613	10.045238	10.362852	18
43	9.637411	437	9.954701	101	9.682710	538	10.317290	10.045299	10.362589	17
44	9.637673	437	9.954640	101	9.683033	538	10.316967	10.045360	10.362327	16
45	9.637935	436	9.954579	101	9.683356	538	10.316644	10.045421	10.362065	15
46	9.638197	436	9.954518	102	9.683679	538	10.316321	10.045482	10.361803	14
47	9.638458	436	9.954457	102	9.684001	537	10.315999	10.045543	10.361542	13
48	9.638720	435	9.954396	102	9.684324	537	10.315676	10.045604	10.361280	12
49	9.638981	435	9.954335	102	9.684646	537	10.315354	10.045665	10.361019	11
50	9.639242	435	9.954274	102	9.684968	537	10.315032	10.045726	10.360758	10
51	9.639503	434	9.954213	102	9.685290	536	10.314710	10.045787	10.360497	9
52	9.639764	434	9.954152	102	9.685612	536	10.314388	10.045848	10.360236	8
53	9.640024	434	9.954090	102	9.685934	536	10.314066	10.045910	10.359976	7
54	9.640284	433	9.954029	102	9.686255	536	10.313745	10.045971	10.359716	6
55	9.640544	433	9.953968	102	9.686577	535	10.313423	10.046032	10.359456	5
56	9.640804	433	9.953906	102	9.686898	535	10.313102	10.046094	10.359196	4
57	9.641064	432	9.953845	102	9.687219	535	10.312781	10.046155	10.358936	3
58	9.641324	432	9.953783	102	9.687540	535	10.312460	10.046217	10.358676	2
59	9.641583	432	9.953722	103	9.687861	534	10.312139	10.046278	10.358417	1
60	9.641842		9.953660		9.688182		10.311818	10.046340	10.358158	0
M	Co-sine.		Sine.		Co-tang.		Tang.	Co-sec.	Secant.	M

64 Degrees.

TABLE XIX.

LOGARITHMIC SINES, TANGENTS, AND SECANTS.

26 Degrees.

M	Sine.	Diff.	Co-sine.	D.	Tang.	Diff.	Co-tang.	Secant.	Co-sec.	M
0	9.641842	431	9.953660	103	9.688182	534	10.311818	10.046340	10.358158	60
1	9.642101	431	9.953599	103	9.688502	534	10.311498	10.046401	10.357899	59
2	9.642360	431	9.953537	103	9.688823	534	10.311177	10.046463	10.357640	58
3	9.642618	430	9.953475	103	9.689143	533	10.310857	10.046525	10.357382	57
4	9.642877	430	9.953413	103	9.689463	533	10.310537	10.046587	10.357123	56
5	9.643135	430	9.953352	103	9.689783	533	10.310217	10.046648	10.356865	55
6	9.643393	430	9.953290	103	9.690103	533	10.309897	10.046710	10.356607	54
7	9.643650	429	9.953228	103	9.690423	533	10.309577	10.046772	10.356350	53
8	9.643908	429	9.953166	103	9.690742	532	10.309258	10.046834	10.356092	52
9	9.644165	429	9.953104	103	9.691062	532	10.308938	10.046896	10.355835	51
10	9.644423	428	9.953042	103	9.691381	532	10.308619	10.046958	10.355577	50
11	9.644680	428	9.952980	104	9.691700	532	10.308300	10.047020	10.355320	49
12	9.644936	428	9.952918	104	9.692019	531	10.307981	10.047082	10.355064	48
13	9.645193	427	9.952855	104	9.692338	531	10.307662	10.047145	10.354807	47
14	9.645450	427	9.952793	104	9.692656	531	10.307344	10.047207	10.354550	46
15	9.645706	427	9.952731	104	9.692975	531	10.307025	10.047269	10.354294	45
16	9.645962	426	9.952669	104	9.693293	530	10.306707	10.047331	10.354038	44
17	9.646218	426	9.952606	104	9.693612	530	10.306388	10.047394	10.353782	43
18	9.646474	426	9.952544	104	9.693930	530	10.306070	10.047456	10.353526	42
19	9.646729	425	9.952481	104	9.694248	530	10.305752	10.047519	10.353271	41
20	9.646984	425	9.952419	104	9.694566	529	10.305434	10.047581	10.353016	40
21	9.647240	425	9.952356	104	9.694883	529	10.305117	10.047644	10.352760	39
22	9.647494	424	9.952294	104	9.695201	529	10.304799	10.047706	10.352506	38
23	9.647749	424	9.952231	104	9.695518	529	10.304482	10.047769	10.352251	37
24	9.648004	424	9.952168	105	9.695836	529	10.304164	10.047832	10.351996	36
25	9.648258	424	9.952106	105	9.696153	528	10.303847	10.047894	10.351742	35
26	9.648512	423	9.952043	105	9.696470	528	10 303530	10.047957	10.351488	34
27	9.648766	423	9.951980	105	9.696787	528	10.303213	10.048020	10.351234	33
28	9.649020	423	9.951917	105	9.697103	528	10.302897	10.048083	10.350980	32
29	9.649274	422	9.951854	105	9.697420	527	10.302580	10.048146	10.350726	31
30	9.649527	422	9.951791	105	9.697736	527	10.302264	10.048209	10.350473	30
31	9.649781	422	9.951728	105	9.698053	527	10.301947	10.048272	10.350219	29
32	9.650034	422	9.951665	105	9.698369	527	10.301631	10.048335	10.349966	28
33	9.650287	421	9.951602	105	9.698685	526	10.301315	10.048398	10.349713	27
34	9.650539	421	9.951539	105	9.699001	526	10.300999	10.048461	10.349461	26
35	9.650792	421	9.951476	105	9.699316	526	10.300684	10.048524	10.349208	25
36	9.651044	420	9.951412	105	9.699632	526	10.300368	10.048588	10.348956	24
37	9.651297	420	9.951349	106	9.699947	526	10.300053	10.048651	10.348703	23
38	9.651549	420	9.951286	106	9.700263	525	10.299737	10.048714	10.348451	22
39	9.651800	419	9.951222	106	9.700578	525	10.299422	10.048778	10.348200	21
40	9.652052	419	9.951159	106	9.700893	525	10.299107	10.048841	10.347948	20
41	9.652304	419	9.951096	106	9.701208	525	10.298792	10.048904	10.347696	19
42	9.652555	418	9.951032	106	9.701523	524	10.298477	10.048968	10.347445	18
43	9.652806	418	9.950968	106	9.701837	524	10.298163	10.049032	10.347194	17
44	9.653057	418	9.950905	106	9.702152	524	10.297848	10.049095	10.346943	16
45	9.653308	418	9.950841	106	9.702466	524	10.297534	10.049159	10.346692	15
46	9.653558	417	9.950778	106	9.702780	523	10.297220	10.049222	10.346442	14
47	9.653808	417	9.950714	106	9.703095	523	10.296905	10.049286	10.346192	13
48	9.654059	417	9.950650	106	9.703409	523	10.296591	10.049350	10.345941	12
49	9.654309	416	9.950586	106	9.703723	523	10.296277	10.049414	10.345691	11
50	9.654558	416	9.950522	107	9.704036	523	10.295964	10.049478	10.345442	10
51	9.654808	416	9.950458	107	9.704350	522	10.295650	10.049542	10 345192	9
52	9.655058	415	9.950394	107	9.704663	522	10.295337	10.049606	10 344942	8
53	9.655307	415	9.950330	107	9.704977	522	10.295023	10.049670	10.344693	7
54	9.655556	415	9.950266	107	9.705290	522	10.294710	10.049734	10.344444	6
55	9.655805	415	9.950202	107	9.705603	521	10.294397	10.049798	10.344195	5
56	9.656054	414	9.950138	107	9.705916	521	10.294084	10.049862	10.343946	4
57	9.656302	414	9.950074	107	9.706228	521	10.293772	10.049926	10.343698	3
58	9.656551	414	9.950010	107	9.706541	521	10.293459	10.049990	10.343449	2
59	9.656799	413	9.949945	107	9.706854	521	10.293146	10.050055	10.343201	1
60	9.657047		9.949881		9.707166		10.292834	10.050119	10.342953	0
M	Co-sine.		Sine.		Co-tang.		Tang.	Co-sec.	Secant.	M

63 Degrees.

TABLE XIX.

LOGARITHMIC SINES, TANGENTS, AND SECANTS.

27 Degrees.

M	Sine.	Diff.	Co-sine.	D.	Tang.	Diff.	Co-tang.	Secant.	Co-sec.	M
0	9.657047	413	9.949881	107	9.707166	520	10.292834	10.050119	10.342953	60
1	9.657295	413	9.949816	107	9.707478	520	10.292522	10.050184	10.342705	59
2	9.657542	412	9.949752	107	9.707790	520	10.292210	10.050248	10.342458	58
3	9.657790	412	9.949688	108	9.708102	520	10.291898	10.050312	10.342210	57
4	9.658037	412	9.949623	108	9.708414	519	10.291586	10.050377	10.341963	56
5	9.658284	412	9.949558	108	9.708726	519	10.291274	10.050442	10.341716	55
6	9.658531	411	9.949494	108	9.709037	519	10.290963	10.050506	10.341469	54
7	9.658778	411	9.949429	108	9.709349	519	10.290651	10.050571	10.341222	53
8	9.659025	411	9.949364	108	9.709660	519	10.290340	10.050636	10.340975	52
9	9.659271	410	9.949300	108	9.709971	518	10.290029	10.050700	10.340729	51
10	9.659517	410	9.949235	108	9.710282	518	10.289718	10.050765	10.340483	50
11	9.659763	410	9.949170	108	9.710593	518	10.289407	10.050830	10.340237	49
12	9.660009	409	9.949105	108	9.710904	518	10.289096	10.050895	10.339991	48
13	9.660255	409	9.949040	108	9.711215	518	10.288785	10.050960	10.339745	47
14	9.660501	409	9.948975	108	9.711525	517	10.288475	10.051025	10.339499	46
15	9.660746	409	9.948910	108	9.711836	517	10.288164	10.051090	10.339254	45
16	9.660991	408	9.948845	108	9.712146	517	10.287854	10.051155	10.339009	44
17	9.661236	408	9.948780	109	9.712456	517	10.287544	10.051220	10.338764	43
18	9.661481	408	9.948715	109	9.712766	516	10.287234	10.051285	10.338519	42
19	9.661726	407	9.948650	109	9.713076	516	10.286924	10.051350	10.338274	41
20	9.661970	407	9.948584	109	9.713386	516	10.286614	10.051416	10.338030	40
21	9.662214	407	9.948519	109	9.713696	516	10.286304	10.051481	10.337786	39
22	9.662459	407	9.948454	109	9.714005	516	10.285995	10.051546	10.337541	38
23	9.662703	406	9.948388	109	9.714314	515	10.285686	10.051612	10.337297	37
24	9.662946	406	9.948323	109	9.714624	515	10.285376	10.051677	10.337054	36
25	9.663190	406	9.948257	109	9.714933	515	10.285067	10.051743	10.336810	35
26	9.663433	405	9.948192	109	9.715242	515	10.284758	10.051808	10.336567	34
27	9.663677	405	9.948126	109	9.715551	514	10.284449	10.051874	10.336323	33
28	9.663920	405	9.948060	109	9.715860	514	10.284140	10.051940	10.336080	32
29	9.664163	405	9.947995	110	9.716168	514	10.283832	10.052005	10.335837	31
30	9.664406	404	9.947929	110	9.716477	514	10.283523	10.052071	10.335594	30
31	9.664648	404	9.947863	110	9.716785	514	10.283215	10.052137	10.335352	29
32	9.664891	404	9.947797	110	9.717093	513	10.282907	10.052203	10.335109	28
33	9.665133	403	9.947731	110	9.717401	513	10.282599	10.052269	10.334867	27
34	9.665375	403	9.947665	110	9.717709	513	10.282291	10.052335	10.334625	26
35	9.665617	403	9.947600	110	9.718017	513	10.281983	10.052400	10.334383	25
36	9.665859	402	9.947533	110	9.718325	513	10.281675	10.052467	10.334141	24
37	9.666100	402	9.947467	110	9.718633	512	10.281367	10.052533	10.333900	23
38	9.666342	402	9.947401	110	9.718940	512	10.281060	10.052599	10.333658	22
39	9.666583	402	9.947335	110	9.719248	512	10.280752	10.052665	10.333417	21
40	9.666824	401	9.947269	110	9.719555	512	10.280445	10.052731	10.333176	20
41	9.667065	401	9.947203	110	9.719862	512	10.280138	10.052797	10.332935	19
42	9.667305	401	9.947136	111	9.720169	511	10.279831	10.952864	10.332695	18
43	9.667546	401	9.947070	111	9.720476	511	10.279524	10.052930	10.332454	17
44	9.667786	400	9.947004	111	9.720783	511	10.279217	10.052996	10.332214	16
45	9.668027	400	9.946937	111	9.721089	511	10.278911	10.053063	10.331973	15
46	9.668267	400	9.946871	111	9.721396	511	10.278604	10.053129	10.331733	14
47	9.668506	399	9.946804	111	9.721702	510	10.278298	10.053196	10.331494	13
48	9.668746	399	9.946738	111	9.722009	510	10.277991	10.053262	10.331254	12
49	9.668986	399	9.946671	111	9.722315	510	10.277685	10.053329	10.331014	11
50	9.669225	399	9.946604	111	9.722621	510	10.277379	10.053396	10.330775	10
51	9.669464	398	9.946538	111	9.722927	510	10.277073	10.053462	10.330536	9
52	9.669703	398	9.946471	111	9.723232	509	10.276768	10.053529	10.330297	8
53	9.669942	398	9.946404	111	9.723538	509	10.276462	10.053596	10.330058	7
54	9.670181	397	9.946337	111	9.723844	509	10.276156	10.053663	10.329819	6
55	9.670419	397	9.946270	112	9.724149	509	10.275851	10.053730	10.329581	5
56	9.670658	397	9.946203	112	9.724454	509	10.275546	10.053797	10.329342	4
57	9.670896	397	9.946136	112	9.724759	508	10.275241	10.053864	10.329104	3
58	9.671134	396	9.946069	112	9.725065	508	10.274935	10.053931	10.328866	2
59	9.671372	396	9.946002	112	9.725369	508	10.274631	10.053998	10.328628	1
60	9.671609		9.945935		9.725674		10.274326	10.054065	10.328391	0
M	Co-sine.		Sine.		Co-tang.		Tang.	Co-sec.	Secant.	M

62 Degrees.

Q

TABLE XIX.

LOGARITHMIC SINES, TANGENTS, AND SECANTS.

28 Degrees.

M	Sine.	Diff.	Co-sine.	D.	Tang.	Diff.	Co-tang.	Secant.	Co-sec.	M
0	9.671609	396	9.945935	112	9.725674	508	10.274326	10.054065	10.328391	60
1	9.671847	395	9.945868	112	9.725979	508	10 274021	10.054132	10 328153	59
2	9.672084	395	9.945800	112	9.726284	507	10.273716	10.054200	10.327916	58
3	9.672321	395	9.945733	112	9.726588	507	10.273412	10.054267	10.327679	57
4	9.672558	395	9.945666	112	9.726892	507	10.273108	10.054334	10.327442	56
5	9.672795	394	9.945598	112	9.727197	507	10.272803	10.054402	10.327205	55
6	9.673032	394	9.945531	112	9.727501	507	10.272499	10.054469	10.326968	54
7	9.673268	394	9.945464	113	9.727805	506	10 272195	10.054536	10.326732	53
8	9.673505	394	9.945396	113	9.728109	506	10.271891	10.054604	10.326495	52
9	9.673741	393	9.945328	113	9.728412	506	10.271588	10.054672	10.326259	51
10	9.673977	393	9.945261	113	9.728716	506	10.271284	10.054739	10.326023	50
11	9.674213	393	9.945193	113	9.729020	506	10.270980	10.054807	10.325787	49
12	9.674448	392	9.945125	113	9.729323	505	10.270677	10.054875	10.325552	48
13	9.674684	392	9.945058	113	9.729626	505	10.270374	10.054942	10.325316	47
14	9.674919	392	9.944990	113	9.729929	505	10.270071	10.055010	10.325081	46
15	9.675155	392	9.944922	113	9.730233	505	10.269767	10.055078	10.324845	45
16	9.675390	391	9.944854	113	9.730535	505	10.269465	10.055146	10.324610	44
17	9.675624	391	9.944786	113	9.730838	504	10.269162	10.055214	10.324376	43
18	9.675859	391	9.944718	113	9.731141	504	10.268859	10.055282	10.324141	42
19	9.676094	391	9.944650	113	9.731444	504	10.268556	10.055350	10.323906	41
20	9.676328	390	9.944582	114	9.731746	504	10.268254	10.055418	10.323672	40
21	9.676562	390	9.944514	114	9.732048	504	10.267952	10.055486	10.323438	39
22	9.676796	390	9.944446	114	9.732351	503	10.267649	10.055554	10.323204	38
23	9.677030	390	9.944377	114	9.732653	503	10.267347	10.055023	10.322970	37
24	9.677264	389	9.944309	114	9.732955	503	10.267045	10.055691	10.322736	36
25	9.677498	389	9.944241	114	9.733257	503	10.266743	10.055759	10.322502	35
26	9.677731	389	9.944172	114	9.733558	503	10.266442	10.055828	10.322269	34
27	9.677964	388	9.944104	114	9.733860	503	10.266140	10.055896	10.322036	33
28	9.678197	388	9.944036	114	9.734162	502	10.265838	10.055964	10.321803	32
29	9.678430	388	9.943967	114	9.734463	502	10.265537	10.056033	10.321570	31
30	9.678663	388	9.943899	114	9.734764	502	10.265236	10.056101	10.321337	30
31	9.678895	387	9.943830	114	9.735066	502	10.264934	10.056170	10.321105	29
32	9.679128	387	9.943761	114	9.735367	502	10.264633	10.056239	10.320872	28
33	9.679360	387	9.943693	115	9.735668	501	10.264332	10.056307	10.320640	27
34	9.679592	387	9.943624	115	9.735969	501	10.264031	10.056376	10.320408	26
35	9.679824	386	9.943555	115	9.736269	501	10.263731	10.056445	10.320176	25
36	9.680056	386	9.943486	115	9 736570	501	10.263430	10.056514	10.319944	24
37	9.680288	386	9.943417	115	9.736871	501	10.263129	10.056583	10.319712	23
38	9.680519	385	9.943348	115	9.737171	500	10 262829	10.056652	10.319481	22
39	9.680750	385	9.943279	115	9.737471	500	10.262529	10.056721	10.319250	21
40	9.680982	385	9.943210	115	9.737771	500	10.262229	10.056790	10.319018	20
41	9.681213	385	9.943141	115	9.738071	500	10.261929	10.056859	10.318787	19
42	9.681443	384	9.943072	115	9 738371	500	10.261629	10.056928	10.318557	18
43	9.681674	384	9.943003	115	9.738671	500	10.261329	10.056997	10.318326	17
44	9.681905	384	9.942934	115	9.738971	499	10.261029	10.057066	10.318095	16
45	9.682135	384	9.942864	115	9.739271	499	10.260729	10.057136	10.317865	15
46	9.682365	383	9.942795	116	9.739570	499	10.260430	10.057205	10.317635	14
47	9.682595	383	9.942726	116	9.739870	499	10.260130	10.057274	10.317405	13
48	9.682825	383	9.942656	116	9.740169	499	10.259831	10.057344	10.317175	12
49	9.683055	383	9.942587	116	9.740468	498	10.259532	10.057413	10.316945	11
50	9.683284	382	9.942517	116	9.740767	498	10.259233	10.057483	10.316716	10
51	9.683514	382	9.942448	116	9.741066	498	10.258934	10.057552	10.316486	9
52	9.683743	382	9.942378	116	9.741365	498	10.258635	10.057622	10.316257	8
53	9.683972	382	9.942308	116	9.741664	498	10.258336	10.057692	10.316028	7
54	9.684201	381	9.942239	116	9.741962	498	10.258038	10.057761	10.315799	6
55	9.684430	381	9.942169	116	9.742261	497	10.257739	10.057831	10.315570	5
56	9.684658	381	9.942099	116	9.742559	497	10.257441	10.057901	10.315342	4
57	9.684887	380	9.942029	116	9.742858	497	10.257142	10.057971	10.315113	3
58	9.685115	380	9 941959	116	9.743156	497	10.256844	10.058041	10.314885	2
59	9.685343	380	9.941889	117	9.743454	497	10.256546	10.058111	10.314657	1
60	9.685571		9.941819		9.743752		10.256248	10.058181	10.314429	0
M	Co-sine.		Sine		Co-tang.		Tang.	Co-sec.	Secant	M

61 Degrees.

TABLE XIX.

LOGARITHMIC SINES, TANGENTS, AND SECANTS.

29 Degrees.

M	Sine.	Diff.	Co-sine.	D.	Tang.	Diff.	Co-tang.	Secant.	Co-sec.	M
0	9.685571	380	9.941819	117	9.743752	496	10.256248	10.058181	10.314429	60
1	9.685799	379	9.941749	117	9.744050	496	10.255950	10.058251	10.414201	59
2	9.686027	379	9.941679	117	9.744348	496	10.255652	10.058321	10.313973	58
3	9.686254	379	9.941609	117	9.744645	496	10.255355	10.058391	10.313746	57
4	9.686482	379	9.941539	117	9.744943	496	10.255057	10.058461	10.313518	56
5	9.686709	378	9.941469	117	9.745240	496	10.254760	10.058531	10.313291	55
6	9.686936	378	9.941398	117	9.745538	495	10.254462	10.058602	10.313064	54
7	9.687163	378	9.941328	117	9.745835	495	10.254165	10.058672	10.312837	53
8	9.687389	378	9.941258	117	9.746132	495	10.253868	10.058742	10.312611	52
9	9.687616	377	9.941187	117	9.746429	495	10.253571	10.058813	10.312384	51
10	9.687843	377	9.941117	117	9.746726	495	10.253274	10.058883	10.312157	50
11	9.688069	377	9.941046	118	9.747023	494	10.252977	10.058954	10.311931	49
12	9.688295	377	9.940975	118	9.747319	494	10.252681	10.059025	10.311705	48
13	9.688521	376	9.940905	118	9.747616	494	10.252384	10.059095	10.311479	47
14	9.688747	376	9.940834	118	9.747913	494	10.252087	10.059166	10,311253	46
15	9.688972	376	9.940763	118	9.748209	494	10.251791	10.059237	10.311028	45
16	9.689198	376	9.940693	118	9.748505	494	10.251495	10.059307	10.310802	44
17	9.689423	375	9.940622	118	9.748801	493	10.251199	10.059378	10.310577	43
18	9.689648	375	9.940551	118	9.749097	493	10.250903	10.059449	10.310352	42
19	9.689873	375	9.940480	118	9.749393	493	10.250607	10.059520	10.310127	41
20	9.690098	375	9.940409	118	9.749689	493	10.250311	10.059591	10.309902	40
21	9.690323	374	9.940338	118	9.749985	493	10.250015	10.059662	10.309677	39
22	9.690548	374	9.940267	118	9.750281	493	10.249719	10.059733	10.309452	38
23	9.690772	374	9.940196	118	9.750576	492	10.249424	10.059804	10.309228	37
24	9.690996	374	9.940125	119	9.750872	492	10.249128	10.059875	10.309004	36
25	9.691220	373	9.940054	119	9.751167	492	10.248833	10.059946	10.308780	35
26	9.691444	373	9.939982	119	9.751462	492	10.248538	10.060018	10.308556	34
27	9.691668	373	9.939911	119	9.751757	492	10.248243	10.060089	10.308332	33
28	9.691892	373	9.939840	119	9.752052	491	10.247948	10.060160	10.308108	32
29	9.692115	372	9.939768	119	9.752347	491	10.247653	10.060232	10.307885	31
30	9.692339	372	9.939697	119	9.752642	491	10.247358	10.060303	10.307661	30
31	9.692562	372	9.939625	119	9.752937	491	10.247063	10.060375	10.307438	29
32	9.692785	371	9.939554	119	9.753231	491	10.246769	10.060446	10.307215	28
33	9.693008	371	9.939482	119	9.753526	491	10.246474	10.060518	10.306992	27
34	9.693231	371	9.939410	119	9.753820	490	10.246180	10.060590	10.306769	26
35	9.693453	371	9.939339	119	9.754115	490	10.245885	10.060661	10.306547	25
36	9.693676	370	9.939267	120	9.754409	490	10.245591	10.060733	10.306324	24
37	9.693898	370	9.939195	120	9.754703	490	10.245297	10.060805	10.306102	23
38	9.694120	370	9.939123	120	9.754997	490	10.245003	10.060877	10.305880	22
39	9.694342	370	9.939052	120	9.755291	490	10.244709	10.060948	10.305658	21
40	9.694564	369	9.938980	120	9.755585	489	10.244415	10.061020	10.305436	20
41	9.694786	369	9.938908	120	9.755878	489	10.244122	10.061092	10.305214	19
42	9.695007	369	9.938836	120	9.756172	489	10.243828	10.061164	10.304993	18
43	9.695229	369	9.938763	120	9.756465	489	10.243535	10.061237	10.304771	17
44	9.695450	368	9.938691	120	9.756759	489	10.243241	10.061309	10.304550	16
45	9.695671	368	9.938619	120	9.757052	489	10.242948	10.061381	10.304329	15
46	9.695892	368	9.938547	120	9.757345	488	10.242655	10.061453	10.304108	14
47	9.696113	368	9.938475	120	9.757638	488	10.242362	10.061525	10.303887	13
48	9.696334	367	9.938402	121	9.757931	488	10.242069	10.061598	10.303666	12
49	9.696554	367	9.938330	121	9.758224	488	10.241776	10.061670	10.303446	11
50	9.696775	367	9.938258	121	9.758517	488	10.241483	10.061742	10.303225	10
51	9.696995	367	9.938185	121	9.758810	488	10.241190	10.061815	10.303005	9
52	9.697215	366	9.938113	121	9.759102	487	10.240898	10.061887	10.302785	8
53	9.697435	366	9.938040	121	9.759395	487	10.240605	10.061960	10.302565	7
54	9.697654	366	9.937967	121	9.759687	487	10.240313	10.062033	10.302346	6
55	9.697874	366	9.937895	121	9.759979	487	10.240021	10.062105	10.302126	5
56	9.698094	365	9.937822	121	9.760272	487	10.239728	10.062178	10.301906	4
57	9.698313	365	9.937749	121	9.760564	487	10.239436	10.062251	10.301687	3
58	9.698532	365	9.937676	121	9.760856	486	10.239144	10.062324	10.301468	2
59	9.698751	365	9.937604	121	9.761148	486	10.238852	10.062396	10.301249	1
60	9.698970		9.937531		9.761439		10.238561	10.062469	10.301030	0
M	Co-sine.		Sine.		Co-tang.		Tang.	Co-sec.	Secant.	M

60 Degrees.

TABLE XIX.

LOGARITHMIC SINES, TANGENTS, AND SECANTS.

30 Degrees.

M	Sine.	Diff.	Co-sine.	D.	Tang.	Diff.	Co-tang.	Secant.	Co-sec.	M
0	9.698970		9.937531		9.761439		10.238561	10.062469	10.301030	60
1	9.699189	364	9.937458	121	9.761731	486	10.238269	10.062542	10.300811	59
2	9.699407	364	9.937385	122	9.762023	486	10.237977	10.062615	10.300593	58
3	9.699626	364	9.937312	122	9.762314	486	10.237686	10.062688	10.300374	57
4	9.699844	364	9.937238	122	9.762606	486	10.237394	10.062762	10.300156	56
5	9.700062	363	9.937265	122	9.762897	485	10.237103	10.062835	10.299938	55
6	9.700280	363	9.937092	122	9.763188	485	10.236812	10.062908	10.299720	54
7	9.700498	363	9.937019	122	9.763479	485	10.236521	10.062981	10.299502	53
8	9.700716	363	9.936946	122	9.763770	485	10.236230	10.063054	10.299284	52
9	9.700933	363	9.936872	122	9.764061	485	10.235939	10.063128	10.299067	51
10	9.701151	362	9.936799	122	9.764352	485	10.235648	10.063201	10.298849	50
11	9.701368	362	9.936725	122	9.764643	485	10.235357	10.063275	10.298632	49
12	9.701585	362	9.936652	122	9.764933	484	10.235067	10.063348	10.298415	48
13	9.701802	362	9.936578	123	9.765224	484	10.234776	10.063422	10.298198	47
14	9.702019	361	9.936505	123	9.765514	484	10.234486	10.063495	10.297981	46
15	9.702236	361	9.936431	123	9.765805	484	10.234195	10.063569	10.297764	45
16	9.702452	361	9.936357	123	9.766095	484	10.233905	10.063643	10.297548	44
17	9.702669	361	9.936284	123	9.766385	484	10.233615	10.063716	10.297331	43
18	9.702885	360	9.936210	123	9.766675	483	10.233325	10.063790	10.297115	42
19	9.703101	360	9.936136	123	9.766965	483	10.233035	10.063864	10.296899	41
20	9.703317	360	9.936062	123	9.767255	483	10.232745	10.063938	10.296683	40
21	9.703533	360	9.935988	123	9.767545	483	10.232455	10.064012	10.296467	39
22	9.703749	359	9.935914	123	9.767834	483	10.232166	10.064086	10.296251	38
23	9.703964	359	9.935840	123	9.768124	483	10.231876	10.064160	10.296036	37
24	9.704179	359	9.935766	123	9.768414	482	10.231586	10.064234	10.295821	36
25	9.704395	359	9.935692	124	9.768703	482	10.231297	10.064308	10.295605	35
26	9.704610	359	9.935618	124	9.768992	482	10.231008	10.064382	10.295390	34
27	9.704825	358	9.935543	124	9.769281	482	10.230719	10.064457	10.295175	33
28	9.705040	358	9.935469	124	9.769570	482	10.230430	10.064531	10.294960	32
29	9.705254	358	9.935395	124	9.769860	482	10.230140	10.064605	10.294746	31
30	9.705469	358	9.935320	124	9.770148	481	10.229852	10.064680	10.294531	30
31	9.705683	357	9.935246	124	9.770437	481	10.229563	10.064254	10.294317	29
32	9.705898	357	9.935171	124	9.770726	481	10.229274	10.064829	10.294102	28
33	9.706112	357	9.935097	124	9.771015	481	10.228985	10.064903	10.293888	27
34	9.706326	357	9.935022	124	9.771303	481	10.228697	10.064978	10.293674	26
35	9.706539	356	9.934948	124	9.771592	481	10.228408	10.065052	10.293461	25
36	9.706753	356	9.934873	124	9.771880	481	10.228120	10.065127	10.293247	24
37	9.706967	356	9.934798	124	9.772168	480	10.227832	10.065202	10.293033	23
38	9.707180	356	9.934723	125	9.772457	480	10.227543	10.065277	10.292820	22
39	9.707393	355	9.934649	125	9.772745	480	10.227255	10.065351	10.292607	21
40	9.707606	355	9.934574	125	9.773033	480	10.226967	10.065426	10.292394	20
41	9.707819	355	9.934499	125	9.773321	480	10.226679	10.065501	10.292181	19
42	9.708032	355	9.934424	125	9.773608	480	10.226392	10.065576	10.291968	18
43	9.708245	354	9.934349	125	9.773896	480	10.226104	10.065651	10.291755	17
44	9.708458	354	9.934274	125	9.774184	479	10.225816	10.065726	10.291542	16
45	9.708670	354	9.934199	125	9.774471	479	10.225529	10.065801	10.291330	15
46	9.708882	354	9.934123	125	9.774759	479	10.225241	10.065877	10.291118	14
47	9.709094	353	9.934048	125	9.775046	479	10.224954	10.065952	10.290906	13
48	9.709306	353	9.933973	125	9.775333	479	10.224667	10.066027	10.290694	12
49	9.709518	353	9.933898	125	9.775621	479	10.224379	10.066102	10.290482	11
50	9.709730	353	9.933822	126	9.775908	478	10.224092	10.066178	10.290270	10
51	9.709941	353	9.933747	126	9.776195	478	10.223805	10.066253	10.290059	9
52	9.710153	352	9.933671	126	9.776482	478	10.223518	10.066329	10.289847	8
53	9.710364	352	9.933596	126	9.776769	478	10.223231	10.066404	10.289636	7
54	9.710575	352	9.933520	126	9.777055	478	10.222945	10.066480	10.289425	6
55	9.710786	352	9.933445	126	9.777342	478	10.222658	10.066555	10.289214	5
56	9.710997	351	9.933369	126	9.777628	478	10.222372	10.066631	10.289003	4
57	9.711208	351	9.933293	126	9.777915	477	10.222085	10.066707	10.288792	3
58	9.711419	351	9.933217	126	9.778201	477	10.221799	10.066783	10.288581	2
59	9.711629	351	9.933141	126	9.778487	477	10.221513	10.066859	10.288371	1
60	9.711839	350	9.933066	126	9.778774	477	10.221226	10.066934	10.288161	0
M	Co-sine.		Sine.		Co-tang.		Tang.	Co-sec.	Secant.	M

59 Degrees.

TABLE XIX.

LOGARITHMIC SINES, TANGENTS, AND SECANTS.

31 Degrees.

M	Sine.	Diff.	Co-sine.	D.	Tang.	Diff.	Co-tang.	Secant.	Co-sec.	M
0	9.711839	350	9.933066	126	9.778774	477	10.221226	10.066934	10.288161	60
1	9.712050	350	9.932990	127	9.779060	477	10.220940	10.067010	10.287950	59
2	9.712260	350	9.932914	127	9.779346	477	10.220654	10.067086	10.287740	58
3	9.712469	349	9.932838	127	9.779632	476	10.220368	10.067162	10.287531	57
4	9.712679	349	9.932762	127	9.779918	476	10.220082	10.067238	10.287321	56
5	9.712889	349	9.932685	127	9.780203	476	10.219797	10.067315	10.287111	55
6	9.713098	349	9.932609	127	9.780489	476	10.219511	10.067391	10.286902	54
7	9.713308	349	9.932533	127	9.780775	476	10.219225	10.067467	10.286692	53
8	9.713517	348	9.932457	127	9.781060	476	10.218940	10.067543	10.286483	52
9	9.713726	348	9.932380	127	9.781346	476	10.218654	10.067620	10.286274	51
10	9.713935	348	9.932304	127	9.781631	475	10.218369	10.067696	10.286065	50
11	9.714144	348	9.932228	127	9.781916	475	10.218084	10.067772	10.285856	49
12	9.714352	347	9.932151	127	9.782201	475	10.217799	10.067849	10.285648	48
13	9.714561	347	9.932075	128	9.782486	475	10.217514	10.067925	10.285439	47
14	9.714769	347	9.931998	128	9.782771	475	10.217229	10.068002	10.285231	46
15	9.714978	347	9.931921	128	9.783056	475	10.216944	10.068079	10.285022	45
16	9.715186	347	9.931845	128	9.783341	475	10.216659	10.068155	10.284814	44
17	9.715394	346	9.931768	128	9.783626	474	10.216374	10.068232	10.284606	43
18	9.715602	346	9.931691	128	9.783910	474	10.216090	10.068309	10.284398	42
19	9.715809	346	9.931614	128	9.784195	474	10.215805	10.068386	10.284191	41
20	9.716017	346	9.931537	128	9.784479	474	10.215521	10.068463	10.283983	40
21	9.716224	345	9.931460	128	9.784764	474	10.215236	10.068540	10.283776	39
22	9.716432	345	9.931383	128	9.785048	474	10.214952	10.068617	10.283568	38
23	9.716639	345	9.931306	128	9.785332	474	10.214668	10.068694	10.283361	37
24	9.716846	345	9.931229	129	9.785616	473	10.214384	10.068771	10.283154	36
25	9.717053	345	9.931152	129	9.785900	473	10.214100	10.068848	10.282947	35
26	9.717259	344	9.931075	129	9.786184	473	10.213816	10.068925	10.282741	34
27	9.717466	344	9.930998	129	9.786468	473	10.213532	10.069002	10.282534	33
28	9.717673	344	9.930921	129	9.786752	473	10.213248	10.069079	10.282327	32
29	9.717879	344	9.930843	129	9.787036	473	10.212964	10.069157	10.282121	31
30	9.718085	343	9.930766	129	9.787319	473	10.212681	10.069234	10.281915	30
31	9.718291	343	9.930688	129	9.787603	472	10.212397	10.069312	10.281709	29
32	9.718497	343	9.930611	129	9.787886	472	10.212114	10.069389	10.281503	28
33	9.718703	343	9.930533	129	9.788170	472	10.211830	10.069467	10.281297	27
34	9.718909	343	9.930456	129	9.788453	472	10.211547	10.069544	10.281091	26
35	9.719114	342	9.930378	129	9.788736	472	10.211264	10.069622	10.280886	25
36	9.719320	342	9.930300	130	9.789019	472	10.210981	10.069700	10.280680	24
37	9.719525	342	9.930223	130	9.789302	472	10.210698	10.069777	10.280475	23
38	9.719730	342	9.930145	130	9.789585	471	10.210415	10.069855	10.280270	22
39	9.719935	341	9.930067	130	9.789868	471	10.210132	10.069933	10.280065	21
40	9.720140	341	9.929989	130	9.790151	471	10.209849	10.070011	10.279860	20
41	9.720345	341	9.929911	130	9.790433	471	10.209567	10.070089	10.279655	19
42	9.720549	341	9.929833	130	9.790716	471	10.209284	10.070167	10.279451	18
43	9.720754	340	9.929755	130	9.790999	471	10.209001	10.070245	10.279246	17
44	9.720958	340	9.929677	130	9.791281	471	10.208719	10.070323	10.279042	16
45	9.721162	340	9.929599	130	9.791563	470	10.208437	10.070401	10.278838	15
46	9.721366	340	9.929521	130	9.791846	470	10.208154	10.070479	10.278634	14
47	9.721570	340	9.929442	130	9.792128	470	10.207872	10.070558	10.278430	13
48	9.721774	339	9.929364	131	9.792410	470	10.207590	10.070636	10.278226	12
49	9.721978	339	9.929286	131	9.792692	470	10.207308	10.070714	10.278022	11
50	9.722181	339	9.929207	131	9.792974	470	10.207026	10.070793	10.277819	10
51	9.722385	339	9.929129	131	9.793256	470	10.206744	10.070871	10.277615	9
52	9.722588	339	9.929050	131	9.793538	469	10.206462	10.070950	10.277412	8
53	9.722791	338	9.928972	131	9.793819	469	10.206181	10.071028	10.277209	7
54	9.722994	338	9.928893	131	9.794101	469	10.205899	10.071107	10.277006	6
55	9.723197	338	9.928815	131	9.794383	469	10.205617	10.071185	10.276803	5
56	9.723400	338	9.928736	131	9.794664	469	10.205336	10.071264	10.276600	4
57	9.723603	337	9.928657	131	9.794945	469	10.205055	10.071343	10.276397	3
58	9.723805	337	9.928578	131	9.795227	469	10.204773	10.071422	10.276195	2
59	9.724007	337	9.928499	131	9.795508	468	10.204492	10.071501	10.275993	1
60	9.724210		9.928420		9.795789		10.204211	10.071580	10.275790	0
M	Co-sine.		Sine.		Co-tang.		Tang.	Co-sec.	Secant.	M

58 Degrees.

TABLE XIX.

LOGARITHMIC SINES, TANGENTS, AND SECANTS.

32 Degrees.

M	Sine.	Diff.	Co-sine.	D.	Tang.	Diff.	Co-tang.	Secant.	Co-sec.	M
0	9.724210	337	9.928420	132	9.795789	468	10.204211	10.071580	10.275790	60
1	9.724412	337	9.928342	132	9.796070	468	10.203930	10.071658	10.275588	59
2	9.724614	336	9.928263	132	9.796351	468	10.203649	10.071737	10.275386	58
3	9.724816	336	9.928183	132	9.796632	468	10.203368	10.071817	10.275184	57
4	9.725017	336	9.928104	132	9.796913	468	10.203087	10.071896	10.274983	56
5	9.725219	336	9.928025	132	9.797194	468	10.202806	10.071975	10.274781	55
6	9.725420	335	9.927946	132	9.797475	468	10.202525	10.072054	10.274580	54
7	9.725622	335	9.927867	132	9.797755	467	10.202245	10.072133	10.274378	53
8	9.725823	335	9.927787	132	9.798036	467	10.201964	10.072213	10.274177	52
9	9.726024	335	9.927708	132	9.798316	467	10.201684	10.072292	10.273976	51
10	9.726225	335	9.927629	132	9.798596	457	10.201404	10.072371	10.273775	50
11	9.726426	334	9.927549	132	9.798877	467	10.201123	10.072451	10.273574	49
12	9.726626	334	9.927470	133	9.799157	467	10.200843	10.072530	10.273374	48
13	9.726827	334	9.927390	133	9.799437	467	10.200563	10.072610	10.273173	47
14	9.727027	334	9.927310	133	9.799717	467	10.200283	10.072690	10.272973	46
15	9.727228	334	9.927231	133	9.799997	466	10.200003	10.072769	10.272772	45
16	9.727428	333	9.927151	133	9.800277	466	10.199723	10.072849	10.272572	44
17	9.727628	333	9.927071	133	9.800557	466	10.199443	10.072929	10.272372	43
18	9.727828	333	9.926991	133	9.800836	466	10.199164	10.073009	10.272172	42
19	9.728027	333	9.926911	133	9.801116	466	10.198884	10.073089	10.271973	41
20	9.728227	333	9.926831	133	9.801396	466	10.198604	10.073169	10.271773	40
21	9.728427	332	9.926751	133	9.801675	466	10.198325	10.073249	10.271573	39
22	9.728626	332	9.926671	133	9.801955	466	10.198045	10.073329	10.271374	38
23	9.728825	332	9.926591	133	9.802234	465	10.197766	10.073409	10.271175	37
24	9.729024	332	9.926511	134	9.802513	465	10.197487	10.073489	10.270976	36
25	9.729223	331	9.926431	134	9.802792	465	10.197208	10.073569	10.270777	35
26	9.729422	331	9.926351	134	9.803072	465	10.196928	10.073649	10.270578	34
27	9.729621	331	9.926270	134	9.803351	465	10.196649	10.073730	10.270379	33
28	9.729820	331	9.926190	134	9.803630	465	10.196370	10.073810	10.270180	32
29	9.730018	330	9.926110	134	9.803908	465	10.196092	10.073890	10.269982	31
30	9.730217	330	9.926029	134	9.804187	465	10.195813	10.073971	10.269783	30
31	9.730415	330	9.925949	134	9.804466	464	10.195534	10.074051	10.269585	29
32	9.730613	330	9.925868	134	9.804745	464	10.195255	10.074132	10.269387	28
33	9.730811	330	9.925788	134	9.805023	464	10.194977	10.074212	10.269189	27
34	9.731009	329	9.925707	134	9.805302	464	10.194698	10.074293	10.268991	26
35	9.731206	329	9.925626	134	9.805580	464	10.194420	10.074374	10.268794	25
36	9.731404	329	9.925545	135	9.805859	464	10.194141	10.074455	10.268596	24
37	9.731608	329	9.925465	135	9.806137	464	10.193863	10.074535	10.268398	23
38	9.731799	329	9.925384	135	9.806415	464	10.193585	10.074616	10.268201	22
39	9.731996	328	9.925303	135	9.806693	463	10.193307	10.074697	16.268004	21
40	9.732193	328	9.925222	135	9.806971	463	10.193029	10.074778	10.267807	20
41	9.732390	328	9.925141	135	9.807249	463	10.192751	10.074859	10.267610	19
42	9.732587	328	9.925060	135	9.807527	463	10.192473	10.074940	10.267413	18
43	9.732784	328	9.924979	135	9.807805	463	10.192195	10.075021	10.267216	17
44	9.732980	327	9.924897	135	9.808083	463	10.191917	10.075103	10.267020	16
45	9.733177	327	9.924816	135	9.808361	463	10.191639	10.075184	10.266823	15
46	9.733373	327	9.924735	136	9.808638	463	10.191362	10.075265	10.266627	14
47	9.733569	327	9.924654	136	9.808916	462	10.191084	10.075346	10.266431	13
48	9.733765	327	9.924572	136	9.809193	462	10.190807	10.075428	10.266235	12
49	9.733961	326	9.924491	136	9.809471	462	10.190529	10.075509	10.266039	11
50	9.734157	326	9.924409	136	9.809748	462	10.190252	10.075591	10.265843	10
51	9.734353	326	9.924328	136	9.810025	462	10.189975	10.075672	10.265647	9
52	9.734549	326	9.924246	136	9.810302	462	10.189698	10.075754	10.265451	8
53	9.734744	325	9.924164	136	9.810580	462	10.189420	10.075836	10.265256	7
54	9.734939	325	9.924083	136	9.810857	462	10.189143	10.075917	10.265061	6
55	9.735135	325	9.924001	136	9.811134	461	10.188866	10.075999	10.264865	5
56	9.735330	325	9.923919	136	9.811410	461	10.188590	10.076081	10.264670	4
57	9.735525	325	9.923837	136	9.811687	461	10.188313	10.076163	10.264475	3
58	9.735719	324	9.923755	137	9.811964	461	10.188036	10.076245	10.264281	2
59	9.735914	324	9.923673	137	9.812241	461	10.187759	10.076327	10.264086	1
60	9.736109		9.923591		9.812517		10.187483	10.076409	10.263891	0
M	Co-sine.		Sine.		Co-tang.		Tang.	Co-sec.	Secant.	M

57 Degrees.

TABLE XIX.

LOGARITHMIC SINES, TANGENTS, AND SECANTS.

33 Degrees.

M	Sine.	Diff.	Co-sine.	D.	Tang.	Diff.	Co-tang.	Secant.	Co-sec.	M
0	9.736109	324	9.923591	137	9.812517	461	10.187483	10.076409	10.263891	60
1	9.736303	324	9.923509	137	9.812794	461	10.187206	10.076491	10.263697	59
2	9.736498	324	9.923427	137	9.813070	461	10.186930	10.076573	10.263502	58
3	9.736692	323	9.923345	137	9.813347	460	10.186653	10.076655	10.263308	57
4	9.736886	323	9.923263	137	9.813623	460	10.186377	10.076737	10.263114	56
5	9.737080	323	9.923181	137	9.813899	460	10.186101	10.076819	10.262920	55
6	9.737274	323	9.923098	137	9.814175	460	10.185825	10.076902	10.262726	54
7	9.737467	323	9.923016	137	9.814452	460	10.185548	10.076984	10.262533	53
8	9.737661	322	9.922933	137	9.814728	460	10.185272	10.077067	10.262339	52
9	9.737855	322	9.922851	137	9.815004	460	10.184996	10.077149	10.262145	51
10	9.738048	322	9.922768	138	9.815279	460	10.184721	10.077232	10.261952	50
11	9.738241	322	9.922686	138	9.815555	460	10.184445	10.077314	10.261759	49
12	9.738434	322	9.922603	138	9.815831	459	10.184169	10.077397	10.261566	48
13	9.738627	321	9.922520	138	9.816107	459	10.183893	10.077480	10.261373	47
14	9.738820	321	9.922438	138	9.816382	459	10.183618	10.077562	10.261180	46
15	9.739013	321	9.922355	138	9.816658	459	10.183342	10.077645	10.260987	45
16	9.739206	321	9.922272	138	9.816933	459	10.183067	10.077728	10.260794	44
17	9.739398	321	9.922189	138	9.817209	459	10.182791	10.077811	10.260602	43
18	9.739590	320	9.922106	138	9.817484	459	10.182516	10.077894	10.260410	42
19	9.739783	320	9.922023	138	9.817759	459	10.182241	10.077977	10.260217	41
20	9.739975	320	9.921940	138	9.818035	459	10.181965	10.078060	10.260025	40
21	9.740167	320	9.921857	139	9.818310	458	10.181690	10.078143	10.259833	39
22	9.740359	320	9.921774	139	9.818585	458	10.181415	10.078226	10.259641	38
23	9.740550	319	9.921691	139	9.818860	458	10.181140	10.078309	10.259450	37
24	9.740742	319	9.921607	139	9.819135	458	10.180865	10.078393	10.259258	36
25	9.740934	319	9.921524	139	9.819410	458	10.180590	10.078476	10.259066	35
26	9.741125	319	9.921441	139	9.819684	458	10.180316	10.078559	10.258875	34
27	9.741316	319	9.921357	139	9.819959	458	10.180041	10.078643	10.258684	33
28	9.741508	318	9.921274	139	9.820234	458	10.179766	10.078726	10.258492	32
29	9.741699	318	9.921190	139	9.820508	458	10.179492	10.078810	10.258301	31
30	9.741889	318	9.921107	139	9.820783	457	10.179217	10.078893	10.258111	30
31	9.742080	318	9.921023	139	9.821057	457	10.178943	10.078977	10.257920	29
32	9.742271	318	9.920939	139	9.821332	457	10.178668	10.079061	10.257729	28
33	9.742462	317	9.920856	140	9.821606	457	10.178394	10.079144	10.257538	27
34	9.742652	317	9.920772	140	9.821880	457	10.178120	10.079228	10.257348	26
35	9.742842	317	9.920688	140	9.822154	457	10.177846	10.079312	10.257158	25
36	9.743033	317	9.920604	140	9.822429	457	10.177571	10.079396	10.256967	24
37	9.743223	317	9.920520	140	9.822703	457	10.177297	10.079480	10.256777	23
38	9.743413	316	9.920436	140	9.822977	457	10.177023	10.079564	10.256587	22
39	9.743602	316	9.920352	140	9.823250	456	10.176750	10.079648	10.256398	21
40	9.743792	316	9.920268	140	9.823524	456	10.176476	10.079732	10.256208	20
41	9.743982	316	9.920184	140	9.823798	456	10.176202	10.079816	10.256018	19
42	9.744171	316	9.920099	140	9.824072	456	10.175928	10.079901	10.255829	18
43	9.744361	315	9.920015	140	9.824345	456	10.175655	10.079985	10.255639	17
44	9.744550	315	9.919931	141	9.824619	456	10.175381	10.080069	10.255450	16
45	9.744739	315	9.919846	141	9.824893	456	10.175107	10.080154	10.255261	15
46	9.744928	315	9.919762	141	9.825166	456	10.174834	10.080238	10.255072	14
47	9.745117	315	9.919677	141	9.825439	456	10.174561	10.080323	10.254883	13
48	9.745306	314	9.919593	141	9.825713	455	10.174287	10.080407	10.254694	12
49	9.745494	314	9.919508	141	9.825986	455	10.174014	10.080492	10.254506	11
50	9.745683	314	9.919424	141	9.826259	455	10.173741	10.080576	10.254317	10
51	9.745871	314	9.919339	141	9.826532	455	10.173468	10.080661	10.254129	9
52	9.746060	314	9.919254	141	9.826805	455	10.173195	10.080746	10.253140	8
53	9.746248	313	9.919169	141	9.827078	455	10.172922	10.080831	10.253752	7
54	9.746436	313	9.919085	141	9.827351	455	10.172649	10.080915	10.253564	6
55	9.746624	313	9.919000	142	9.827624	455	10.172376	10.081000	10.253376	5
56	9.746812	313	9.918915	142	9.827897	455	10.172103	10.081085	10.253188	4
57	9.746999	313	9.918830	142	9.828170	454	10.171830	10.081170	10.253001	3
58	9.747187	312	9.918745	142	9.828442	454	10.171558	10.081255	10.252813	2
59	9.747374	312	9.918659	142	9.828715	454	10.171285	10.081341	10.252626	1
60	9.747562		9.918574		9.828987		10.171013	10.081426	10.252438	0
M	Co-sine.		Sine.		Co-tang.		Tang.	Co-sec.	Secant.	M

56 Degrees.

TABLE XIX.

LOGARITHMIC SINES, TANGENTS, AND SECANTS.

34 Degrees.

M	Sine.	Diff.	Co-sine.	D.	Tang.	Diff.	Co-tang.	Secant.	Co-sec.	M
0	9.747562	312	9.918574	142	9.828987	454	10.171013	10.081426	10.252438	60
1	9.747749	312	9.918489	142	9.829260	454	10.170740	10.081511	10.252251	59
2	9.747936	312	9.918404	142	9.829532	454	10.170468	10.081596	10.252064	58
3	9.748123	311	9.918318	142	9.829805	454	10.170195	10.081682	10.251877	57
4	9.748310	311	9.918233	142	9.830077	454	10.169923	10.081767	10.251690	56
5	9.748497	311	9.918147	142	9.830349	454	10.169651	10.081853	10.251503	55
6	9.748683	311	9.918062	143	9.830621	453	10.169379	10.081938	10.251317	54
7	9.748870	311	9.917976	143	9.830893	453	10.169107	10.082024	10.251130	53
8	9.749056	310	9.917891	143	9.831165	453	10.168835	10.082109	10.250944	52
9	9.749243	310	9.917805	143	9.831437	453	10.168563	10.082195	10.250757	51
10	9.749429	310	9.917719	143	9.831709	453	10.168291	10.082281	10.250571	50
11	9.749615	310	9.917634	143	9.831981	453	10.168019	10.082366	10.250385	49
12	9.749801	310	9.917548	143	9.832253	453	10.167747	10.082452	10.250199	48
13	9.749987	309	9.917462	143	9.832525	453	10.167475	10.082538	10.250013	47
14	9.750172	309	9.917376	143	9.832796	453	10.167204	10.082624	10.249828	46
15	9.750358	309	9.917290	143	9.833068	453	10.166932	10.082710	10.249642	45
16	9.750543	309	9.917204	143	9.833339	452	10.166661	10.082796	10.249457	44
17	9.750729	309	9.917118	144	9.833611	452	10.166389	10.082882	10.249271	43
18	9.750914	308	9.917032	144	9.833882	452	10.166118	10.082968	10.249086	42
19	9.751099	308	9.916946	144	9.834154	452	10.165846	10.083054	10.248901	41
20	9.751284	308	9.916859	144	9.834425	452	10.165575	10.083141	10.248716	40
21	9.751469	308	9.916773	144	9.834696	452	10.165304	10.083227	10.248531	39
22	9.751654	308	9.916687	144	9.834967	452	10.165033	10.083313	10.248346	38
23	9.751839	308	9.916600	144	9.835238	452	10.164762	10.083400	10.248161	37
24	9.752023	307	9.916514	144	9.835509	452	10.164491	10.083486	10.247977	36
25	9.752208	307	9.916427	144	9.835780	452	10.164220	10.083573	10.247792	35
26	9.752392	307	9.916341	144	9.836051	451	10.163949	10.083659	10.247608	34
27	9.752576	307	9.916254	144	9.836322	451	10.163678	10.083746	10.247424	33
28	9.752760	307	9.916167	145	9.836593	451	10.163407	10.083833	10.247240	32
29	9.752944	306	9.916081	145	9.836864	451	10.163136	10.083919	10.247056	31
30	9.753128	306	9.915994	145	9.837134	451	10.162866	10.084006	10.246872	30
31	9.753312	306	9.915907	145	9.837405	451	10.162595	10.084093	10.246688	29
32	9.753495	306	9.915820	145	9.837675	451	10.162325	10.084180	10.246505	28
33	9.753679	306	9.915733	145	9.837946	451	10.162054	10.084267	10.246321	27
34	9.753862	305	9.915646	145	9.838216	451	10.161784	10.084354	10.246138	26
35	9.754046	305	9.915559	145	9.838487	451	10.161513	10.084441	10.245954	25
36	9.754229	305	9.915472	145	9.838757	450	10.161243	10.084528	10.245771	24
37	9.754412	305	9.915385	145	9.839027	450	10.160973	10.084615	10.245588	23
38	9.754595	305	9.915297	145	9.839297	450	10.160703	10.084703	10.245405	22
39	9.754778	304	9.915210	145	9.839568	450	10.160432	10.084790	10.245222	21
40	9.754960	304	9.915123	146	9.839838	450	10.160162	10.084877	10.245040	20
41	9.755143	304	9.915035	146	9.840108	450	10.159892	10.084965	10.244857	19
42	9.755326	304	9.914948	146	9.840378	450	10.159622	10.085052	10.244674	18
43	9.755508	204	9.914860	146	9.840647	450	10.159353	10.085140	10.244492	17
44	9.755690	304	9.914773	146	9.840917	450	10.159083	10.085227	10.244310	16
45	9.755872	303	9.914685	146	9.841187	450	10.158813	10.085315	10.244128	15
46	9.756054	303	9.914598	146	9.841457	449	10.158543	10.085402	10.243946	14
47	9.756236	303	9.914510	146	9.841726	449	10.158274	10.085490	10.243764	13
48	9.756418	303	9.914422	146	9.841996	449	10.158004	10.085578	10.243582	12
49	9.756600	303	9.914334	146	9.842266	449	10.157734	10.085666	10.243400	11
50	9.756782	302	9.914246	147	9.842535	449	10.157465	10.085754	10.243218	10
51	9.756963	302	9.914158	147	9.842805	449	10.157195	10.085842	10.243037	9
52	9.757144	302	9.914070	147	9.843074	449	10.156926	10.085930	10.242856	8
53	9.757326	302	9.913982	147	9.843343	449	10.156657	10.086018	10.242674	7
54	9.757507	302	9.913894	147	9.843612	449	10.156388	10.086106	10.242493	6
55	9.757688	301	9.913806	147	9.843882	449	10.156118	10.086194	10.242312	5
56	9.757869	301	9.913718	147	9.844151	448	10.155849	10.086282	10.242131	4
57	9.758050	301	9.913630	147	9.844420	448	10.155580	10.086370	10.241950	3
58	9.758230	301	9.913541	147	9.844689	448	10.155311	10.086459	10.241770	2
59	9.758411	301	9.913453	147	9.844958	448	10.155042	10.086547	10.241589	1
60	9.758591		9.913365		9.845227		10.154773	10.086635	10.241409	0
M	Co-sine.		Sine.		Co-tang.		Tang.	Co-sec.	Secant.	M

55 Degrees.

TABLE XIX.

LOGARITHMIC SINES, TANGENTS, AND SECANTS.

35 Degrees.

M	Sine.	Diff.	Co-sine.	D.	Tang.	Diff.	Co-tang.	Secant.	Co-sec.	M
0	9.758591	301	9.913365	147	9.845227	449	10.154773	10.086635	10.241409	60
1	9.758772	300	9.913276	147	9.845496	448	10.154504	10.086724	10.241228	59
2	9.758952	300	9.913187	148	9.845764	448	10.154236	10.086813	10.241048	58
3	9.759132	300	9.913099	148	9.846033	448	10.153967	10.086901	10.240868	57
4	9.759312	300	9.913010	148	9.846302	448	10.153698	10.086990	10.240688	56
5	9.759492	300	9.912922	148	9.846570	448	10.153430	10.087078	10.240508	55
6	9.759672	299	9.912833	148	9.846839	448	10.153161	10.087167	10.240328	54
7	9.759852	299	9.912744	148	9.847107	447	10.152893	10.087256	10.240148	53
8	9.760031	299	9.912655	148	9.847376	447	10.152624	10.087345	10.239969	52
9	9.760211	299	9.912566	148	9.847644	447	10.152356	10.087434	10.239789	51
10	9.760390	299	9.912477	148	9.847913	447	10 152087	10.087523	10.239610	50
11	9.760569	298	9.912388	148	9.848181	447	10.151819	10.087612	10.239431	49
12	9.760748	298	9.912299	149	9.848449	447	10.151551	10.087701	10.239252	48
13	9.760927	298	9.912210	149	9.848717	447	10.151283	10.087790	10.239073	47
14	9.761106	298	9.912121	149	9.848986	447	10.151014	10.087879	10.238894	46
15	9.761285	298	9.912031	149	9.849254	447	10.150746	10.087969	10.238715	45
16	9.761464	298	9.911942	149	9.849522	447	10.150478	10.088058	10.238536	44
17	9.761642	297	9.911853	149	9.849790	446	10.150210	10.088147	10.238358	43
18	9.761821	297	9.911763	149	9.850058	446	10.149942	10.088237	10.238179	42
19	9.761999	297	9.911674	149	9.850325	446	10.149675	10.088326	10.238001	41
20	9.762177	297	9.911584	149	9.850593	446	10.149407	10.088416	10.237823	40
21	9.762356	297	9.911495	149	9.850861	446	10.149139	10.088505	10.237644	39
22	9.762534	296	9.911405	149	9.851129	446	10.148871	10.088595	10.237466	38
23	9.762712	296	9.911315	150	9.851390	446	10.148604	10.088685	10.237288	37
24	9.762889	296	9.911226	150	9.851664	446	10.148336	10.088774	10.237111	36
25	9.763067	296	9.911136	150	9.851931	446	10.148069	10.088864	10.236933	35
26	9.763245	296	9.911046	150	9.852199	446	10.147801	10.088954	10.236755	34
27	9.763422	296	9.910956	150	9.852466	446	10.147534	10.089044	10.236578	33
28	9.763600	295	9.910866	150	9.852733	445	10.147267	10.089134	10.236400	32
29	9.763777	295	9.910776	150	9.853001	445	10.146999	10.089224	10.236223	31
30	9.763954	295	9.910686	150	9.853268	445	10.146732	10.089314	10.236046	30
31	9.764131	295	9.910596	150	9.853535	445	10.146465	10.089404	10.235869	29
32	9.764308	295	9.910506	150	9.853802	445	10.146198	10.089494	10.235692	28
33	9.764485	294	9.910415	150	9.854069	445	10.145931	10.089585	10.235515	27
34	9.764662	294	9.910325	151	9.854336	445	10.145664	10.089675	10.235338	26
35	9.764838	294	9.910235	151	9.854603	446	10 145397	10.089765	10.235162	25
36	9.765015	294	9.910144	151	9.854870	445	10.145130	10.089856	10.234985	24
37	9.765191	294	9.910054	151	9.855137	445	10.144863	10.089946	10.234809	23
38	9.765367	294	9.909963	151	9.855404	445	10.144596	10.090037	10.234633	22
39	9.765544	293	9.909873	151	9.855671	444	10.144329	10.090127	10.234456	21
40	9.765720	293	9.909782	151	9.855938	444	10.144062	10.090218	10.234280	20
41	9.765896	293	9.909691	151	9.856204	444	10.143796	10.090309	10.234104	19
42	9.766072	293	9.909601	151	9.856471	444	10.143529	10.090399	10.233928	18
43	9.766247	293	9.909510	151	9.856737	444	10.143263	10.090490	10.233753	17
44	9.766423	293	9.909419	151	9.857004	444	10.142996	10.090581	10.233577	16
45	9.766598	292	9.909328	152	9.857270	444	10.142730	10.090672	10.233402	15
46	9.766774	292	9.909237	152	9.857537	444	10.142463	10.090763	10.233226	14
47	9.766949	292	9.909146	152	9.857803	444	10.142197	10.090854	10.233051	13
48	9.767124	292	9.909055	152	9.858069	444	10.141931	10.090945	10.232876	12
49	9.767300	292	9.908964	152	9.858336	444	10.141664	10.091036	10.232700	11
50	9.767475	291	9.908873	152	9.858602	444	10.141398	10.091127	10.232525	10
51	9.767649	291	9.908781	152	9.858868	443	10.141132	10 091219	10.232351	9
52	9.767824	291	9.908690	152	9.859134	443	10.140866	10.091310	10.232176	8
53	9.767999	291	9.908599	152	9.859400	443	10.140600	10.091401	10.232001	7
54	9.768173	291	9.908507	152	9.859666	443	10.140334	10.091493	10.231827	6
55	9.768348	290	9.908416	153	9.859932	443	10.140068	10.091584	10.231652	5
56	9.768522	290	9.908324	153	9.860198	443	10.139802	10.091676	10.231478	4
57	9.768697	290	9.908233	153	9.860464	443	10.139536	10.091767	10.231303	3
58	9.768871	290	9.908141	153	9.860730	443	10.139270	10.091859	10.231129	2
59	9.769045	290	9.908049	153	9.860995	443	10.139005	10.091951	10.230955	1
60	9.769219		9.907958		9.861261		10.138739	10.092042	10.230781	0
M	Co-sine.		Sine.		Co-tang.		Tang.	Co-sec.	Secant.	M

54 Degrees.

TABLE XIX.

LOGARITHMIC SINES, TANGENTS, AND SECANTS.

36 Degrees.

M	Sine.	Diff.	Co-sine.	D.	Tang.	Diff.	Co-tang.	Secant.	Co-sec.	M
0	9.769219	290	9.907958	153	9.861261	443	10.138739	10.092042	10.230781	60
1	9.769393	289	9.907866	153	9.861527	443	10.138473	10.092134	10.230607	59
2	9.769566	289	9.907774	153	9.861792	443	10.138208	10.092226	10.230434	58
3	9.769740	289	9.907682	153	9.862058	442	10.137942	10.092318	10.230260	57
4	9.769913	289	9.907590	153	9.862323	442	10.137677	10.092410	10.230087	56
5	9.770087	289	9.907498	153	9.862589	442	10.137411	10.092502	10.229913	55
6	9.770260	288	9.907406	153	9.862854	442	10.137146	10.092594	10.229740	54
7	9.770433	288	9.907314	154	9.863119	442	10.136881	10.092686	10.229567	53
8	9.770606	288	9.907222	154	9.863385	442	10.136615	10.092778	10.229394	52
9	9.770779	288	9.907129	154	9.863650	442	10.136350	10.092871	10.229221	51
10	9.770952	288	9.907037	154	9.863915	442	10.136084	10.092963	10.229048	50
11	9.771125	288	9.906945	154	9.864180	442	10.135820	10.093055	10.228875	49
12	9.771298	287	9.906852	154	9.864445	442	10.135555	10.093148	10.228702	48
13	9.771470	287	9.906760	154	9.864710	442	10.135290	10.093240	10.228530	47
14	9.771643	287	9.906667	154	9.864975	442	10.135025	10.093333	10.228357	46
15	9.771815	287	9.906575	154	9.865240	441	10.134760	10.093425	10.228185	45
16	9.771987	287	9.906482	154	9.865505	441	10.134495	10.093518	10.228013	44
17	9.772159	287	9.906389	155	9.865770	441	10.134230	10.093611	10.227841	43
18	9.772331	286	9.906296	155	9.866035	441	10.133965	10.093704	10.227669	42
19	9.772503	286	9.906204	155	9.866300	441	10.133700	10.093796	10.227497	41
20	9.772675	286	9.906111	155	9.866564	441	10.133436	10.093889	10.227325	40
21	9.772847	286	9.906018	155	9.866829	441	10.133171	10.093982	10.227153	39
22	9.773018	286	9.905925	155	9.867094	441	10.132906	10.094075	10.226982	38
23	9.773190	286	9.905832	155	9.867358	441	10.132642	10·094168	10.226810	37
24	9.773361	285	9.905739	155	9.867623	441	10.132377	10.094261	10.226639	36
25	9.773533	285	9.905645	155	9.867887	441	10.132113	10.094355	10.226467	35
26	9.773704	285	9.905552	155	9.868152	441	10.131848	10.094448	10.226296	34
27	9.773875	285	9.905459	155	9.868416	441	10.131584	10.094541	10.226125	33
28	9.774046	285	9.905366	156	9.868680	440	10.131320	10.094634	10.225954	32
29	9.774217	285	9.905272	156	9.868945	440	10.131055	10 094728	10.225783	31
30	9.774388	284	9.905179	156	9.869209	440	10.130791	10.094821	10.225612	30
31	9.774558	284	9.905085	156	9.869473	440	10.130527	10.094915	10.225442	29
32	9.774729	284	9.904992	156	9.869737	440	10.130263	10.095008	10.225271	28
33	9.774899	284	9.904898	156	9.870001	440	10.129999	10.095102	10.225101	27
34	9.775070	284	9.904804	156	9.870265	440	10.129735	10.095196	10.224930	26
35	9.775240	284	9.904711	156	9.870529	440	10.129471	10.095289	10.224760	25
36	9.775410	283	9.904617	156	9.870793	440	10.129207	10.095383	10.224590	24
37	9.775580	283	9.904523	156	9.871057	440	10.128943	10.095477	10.224420	23
38	9.775750	283	9.904429	157	9.871321	440	10.128679	10.095571	10.224250	22
39	9.775920	283	9.904335	157	9.871585	440	10.128415	10.095665	10.224080	21
40	9.776090	283	9.904241	157	9.871849	440	10.128151	10.095759	10.223910	20
41	9.776259	283	9.904147	147	9.872112	439	10.127888	10.095853	10.223741	19
42	9.776429	282	9.904053	157	9.872376	439	10.127624	10.095947	10.223571	18
43	9.776598	282	9.903959	157	9.872640	439	10.127360	10.096041	10.223402	17
44	9.776768	282	9.903864	157	9.872903	439	10.127097	10.096136	10.223232	16
45	9.776937	282	9.903770	157	9.873167	439	10.126833	10.096230	10.223063	15
46	9.777106	282	9.903676	157	9.873430	439	10.126570	10.096324	10.222894	14
47	9.777275	281	9.903581	157	9.873694	439	10.126306	10.096419	10.222725	13
48	9.777444	281	9.903487	157	9.873957	439	10.126043	10.096513	10.222556	12
49	9.777613	281	9.903392	158	9.874220	439	10.125780	10.096608	10.222387	11
50	9.777781	281	9.903298	158	9.874484	439	10.125516	10.096702	10.222219	10
51	9.777950	281	9.903203	158	9.874747	439	10.125253	10.096797	10.222050	9
52	9.778119	281	9.903108	158	9.875010	439	10.124990	10.096892	10.221881	8
53	9.778287	280	9.903014	158	9.875273	439	10 124727	10.096986	10.221713	7
54	9.778455	280	9.902919	158	9.875536	439	10.124464	10.097081	10.221545	6
55	9.778624	280	9.902824	158	9.875800	438	10.124200	10.097176	10.221376	5
56	9.778792	280	9.902729	158	9.876063	438	10.123937	10.097271	10.221208	4
57	9.778960	280	9.902634	158	9.876326	438	10.123674	10.097366	10.221040	3
58	9.779128	280	9.902539	159	9.876589	438	10.123411	10.097461	10.220872	2
59	9.779295	279	9.902444	159	9.876851	438	10.123149	10.097556	10.220705	1
60	9.779463		9.902349		9.877114		10.122886	10.097651	10.220537	0
M	Co-sine.		Sine.		Co-tang.		Tang.	Co-sec.	Secant.	M

53 Degrees.

TABLE XIX.

LOGARITHMIC SINES, TANGENTS, AND SECANTS.

37 Degrees.

M	Sine.	Diff.	Co-sine.	D.	Tang.	Diff.	Co-tang.	Secant.	Co-sec.	M
0	9.779463	279	9.902349	159	9.877114	438	10.122886	10.097651	10.220537	60
1	9.779631	279	9.902253	159	9.877377	438	10.122623	10.097747	10.220369	59
2	9.779798	279	9.902158	159	9.877640	438	10.122360	10.097842	10.220202	58
3	9.779966	279	9.902063	159	9.877903	438	10.122097	10.097937	10.220034	57
4	9.780133	279	9.901967	159	9.878165	438	10.121835	10.098033	10.219867	56
5	9.780300	278	9.901872	159	9.878428	438	10.121572	10.098128	10.219700	55
6	9.780467	278	9.901776	159	9.878691	438	10.121309	10.098224	10.219533	54
7	9.780634	278	9.901681	159	9.878953	437	10.121047	10.098319	10.219366	53
8	9.780801	278	9.901585	159	9.879216	437	10.120784	10.098415	10.219199	52
9	9.780968	278	9.901490	159	9.879478	437	10.120522	10.098510	10.219032	51
10	9.781134	278	9.901394	160	9.879741	437	10.120259	10.098606	10.218866	50
11	9.781301	277	9.901298	160	9.880003	437	10.119997	10.098702	10.218699	49
12	9.781468	277	9.901202	160	9.880265	437	10.119735	10.098798	10.218532	48
13	9.781634	277	9.901106	160	9.880528	437	10.119472	10.098894	10.218366	47
14	9.781800	277	9.901010	160	9.880790	437	10.119210	10.098990	10.218200	46
15	9.781966	277	9.900914	160	9.881052	437	10.118948	10.099086	10.218034	45
16	9.782132	277	9.900818	160	9.881314	437	10.118686	10.099183	10.217868	44
17	9.782298	276	9.900722	160	9.881576	437	10.118424	10.099278	10.217702	43
18	9.782464	276	9.900626	160	9.881839	437	10.118161	10.099374	10.217536	42
19	9.782630	276	9.900529	160	9.882101	437	10.117899	10.099471	10.217370	41
20	9.782796	276	9.900433	161	9.882363	437	10.117637	10.099567	10.217204	40
21	9.782961	276	9.900337	161	9.882625	436	10.117375	10.099663	10.217039	39
22	9.783127	276	9.900240	161	9.882887	436	10.117113	10.099760	10.216873	38
23	9.783292	275	9.900144	161	9.883148	436	10.116852	10.099856	10.216708	37
24	9.783458	275	9.900047	161	9.883410	436	10.116590	10.099953	10.216542	36
25	9.783623	275	9.899951	161	9.883672	436	10.116328	10.100049	10.216377	35
26	9.783788	275	9.899854	161	9.883934	436	10.116066	10.100146	10.216212	34
27	9.783953	275	9.899757	161	9.884196	436	10.115804	10.100243	10.216047	33
28	9.784118	275	9.899660	161	9.884457	436	10.115543	10.100340	10.215882	32
29	9.784282	274	9.899564	161	9.884719	436	10.115281	10.100436	10.215718	31
30	9.784447	274	9.899467	162	9.884980	436	10.115020	10.100533	10.215553	30
31	9.784612	274	9.899370	162	9.885242	436	10.114758	10.100630	10.215388	29
32	9.784776	274	9.899273	162	9.885503	436	10.114497	10.100727	10.215224	28
33	9.784941	274	9.899176	162	9.885765	436	10.114235	10.100824	10.215059	27
34	9.785105	274	9.899078	162	9.886026	436	10.113974	10.100922	10.214895	26
35	9.785269	273	9.898981	162	9.886288	436	10.113712	10.101019	10.214731	25
36	9.785433	273	9.898884	162	9.886549	436	10.113451	10.101116	10.214567	24
37	9.785597	273	9.898787	162	9.886810	435	10.113190	10.101213	10.214403	23
38	9.785761	273	9.898689	162	9.887072	435	10.112928	10.101311	10.214239	22
39	9.785925	273	9.898592	162	9.887333	435	10.112667	10.101408	10.214075	21
40	9.786089	273	9.898494	163	9.887594	435	10.112406	10.101506	10.213911	20
41	9.786252	272	9.898397	163	9.887855	435	10.112145	10.101603	10.213748	19
42	9.786416	272	9.898299	163	9.888116	435	10.111884	10.101701	10.213584	18
43	9.786579	272	9.898202	163	9.888377	435	10.111623	10.101798	10.213421	17
44	9.786742	272	9.898104	163	9.888639	435	10.111361	10.101896	10.213258	16
45	9.786906	272	9.898006	163	9.888900	435	10.111100	10.101994	10.213094	15
46	9.787069	272	9.987908	163	9.889160	435	10.110840	10.102092	10.212931	14
47	9.787232	271	9.897810	163	9.889421	435	10.110579	10.102190	10.212768	13
48	9.787395	271	9.897712	163	9.889682	435	10.110318	10.102288	10.212605	12
49	9.787557	271	9.897614	163	9.889943	435	10.110057	10.102386	10.212443	11
50	9.787720	271	9.897516	163	9.890204	435	10.109796	10.102484	10.212280	10
51	9.787883	271	9.897418	164	9.890465	435	10.109535	10.102582	10.212117	9
52	9.788045	271	9.897320	164	9.890725	434	10.109275	10.102680	10.211955	8
53	9.788208	271	9.897222	164	9.890986	434	10.109014	10.102778	10.211792	7
54	9.788370	270	9.897123	164	9.891247	434	10.108753	10.102877	10.211630	6
55	9.788532	270	9.897025	164	9.891507	434	10.108493	10.102975	10.211468	5
56	9.788694	270	9.896926	164	9.891768	434	10.108232	10.103074	10.211306	4
57	9.788856	270	9.896828	164	9.892028	434	10.107972	10.103172	10.211144	3
58	9.789018	270	9.896729	164	9.892289	434	10.107711	10.103271	10.210982	2
59	9.789180	270	9.896631	164	9.892549	434	10.107451	10.103369	10.210820	1
60	9.789342		9.896532		9.892810		10.107190	10.103468	10.210658	0
M	Co-sine.		Sine.		Co-tang.		Tang.	Co-sec.	Secant.	M

52 Degrees.

TABLE XIX.

LOGARITHMIC SINES, TANGENTS, AND SECANTS.

38 Degrees.

M	Sine.	Diff.	Co-sine.	D.	Tang.	Diff.	Co-tang	Secant.	Co-sec.	M
0	9.789342	269	9.896532	164	9.892810	434	10.107190	10.103468	10.210658	60
1	9.789504	269	9.896433	165	9.893070	434	10.106930	10.103567	10.210496	59
2	9.789665	269	9.896335	165	9.893331	434	10 106669	10.103665	10.210335	58
3	9.789827	269	9.896236	165	9.893591	434	10.106409	10.103764	10.210173	57
4	9.789988	269	9.896137	165	9.893851	434	10.106149	10.103863	10.210012	56
5	9.790149	269	9.896038	165	9.894111	434	10.105889	10.103962	10.209851	55
6	9.790310	268	9.895939	165	9.894371	434	10.105629	10.104061	10.209690	54
7	9.790471	268	9.895840	165	9.894632	434	10.105368	10.104160	10.209529	53
8	9.790632	268	9.895741	165	9.894892	433	10.105108	10.104259	10.209368	52
9	9.790739	268	9.895641	165	9.895152	433	10.104848	10.104359	10.209207	51
10	9.790954	268	9.895542	165	9.895412	433	10.104588	10.104458	10.209046	50
11	9.791115	268	9.895443	166	9.895672	433	10.104328	10.104557	10.208885	49
12	9.791275	267	9.895343	166	9.895932	433	10.104068	10.104657	10.208725	48
13	9.791436	267	9.895244	166	9.896192	433	10.103808	10.104756	10.208564	47
14	9.791596	267	9.895145	166	9.896452	433	10.103548	10.104855	10.208404	46
15	9.791757	267	9.895045	166	9.896712	433	10.103288	10.104955	10.208243	45
16	9.791917	267	9.894945	166	9.896971	433	10.103029	10.105055	10.208083	44
17	9.792077	267	9.894846	166	9.897231	433	10.102769	10.105154	10.207923	43
18	9.792237	266	9.894746	166	9.897491	433	10.102509	10.105254	10.207763	42
19	9.792397	266	9.894646	166	9.897751	433	10.102249	10.105354	10.207603	41
20	9.792557	266	9.894546	166	9.898010	433	10.101990	10.105454	10.207443	40
21	9.792716	266	9.894446	167	9.898270	433	10.101730	10.105554	10.207284	39
22	9.792876	266	9.894346	167	9.898530	433	10.101470	10.105654	10.207124	38
23	9.793035	266	9.894246	167	9.898789	433	10.101211	10.105754	10.206965	37
24	9.793195	265	9.894146	167	9.899049	432	10.100951	10.105854	10.206805	36
25	9.793354	265	9.894046	167	9.899308	432	10.100692	10.105954	10.206646	35
26	9.793514	265	9.893946	167	9.899568	432	10.100432	10.106054	10.206486	34
27	9.793673	265	9.893846	167	9.899827	432	10.100173	10.106154	10.206327	33
28	9.793832	265	9.893745	167	9.900086	432	10.099914	10.106255	10.206168	32
29	9.793991	265	9.893645	167	9.900346	432	10.099654	10.106355	10.206009	31
30	9.794150	264	9.893544	167	9.900605	432	10.099395	10.106456	10.205850	30
31	9.794308	264	9.893444	168	9.900864	432	10.099136	10.106556	10.205692	29
32	9.794467	264	9.893343	168	9.901124	432	10.098876	10.106657	10.205533	28
33	9.794626	264	9.893243	168	9.901383	432	10.098617	10.106757	10.205374	27
34	9.794784	264	9.893142	168	9.901642	432	10.098358	10.106858	10.205216	26
35	9.794942	264	9.893041	168	9.901901	432	10.098099	10.106959	10.205058	25
36	9.795101	264	9.892940	168	9.902160	432	10.097840	10.107060	10.204899	24
37	9.795259	263	9.892839	168	9.902419	432	10.097581	10.107161	10.204741	23
38	9.795417	263	9.892739	168	9.902679	432	10.097321	10.107261	10.204583	22
39	9.795575	263	9.892638	168	9.902938	432	10.097062	10.107362	10.204425	21
40	9.795733	263	9.892536	168	9.903197	432	10.096803	10.107464	10.204267	20
41	9.795891	263	9.892435	169	9.903455	431	10.096545	10.107565	10.204109	19
42	9.796049	263	9.892334	169	9.903714	431	10.096286	10.107666	10.203951	18
43	9.796206	263	9.892233	169	9.903973	431	10.096027	10.107767	10.203794	17
44	9.796364	262	9.892132	169	9.904232	431	10.095768	10.107868	10.203636	16
45	9.796521	262	9.892030	169	9.904491	431	10.095509	10.107970	10.203479	15
46	9.796679	262	9.891929	169	9.904750	431	10.095250	10.108071	10.203321	14
47	9.796836	262	9.891827	169	9.905008	431	10.094992	10.108173	10.203164	13
48	9.796993	262	9.891726	169	9.905267	431	10.094733	10.108274	10.203007	12
49	9.797150	262	9.891624	169	9.905526	431	10.094474	10.108376	10.202850	11
50	9.797307	261	9.891523	169	9.905784	431	10.094216	10.108477	10.202693	10
51	9.797464	261	9.891421	170	9.906043	431	10.093957	10.108579	10.202536	9
52	9.797621	261	9.891319	170	9.906302	431	10.093698	10.108681	10.202379	8
53	9.797777	261	9.891217	170	9.906560	431	10.093440	10.108783	10.202223	7
54	9.797934	261	9.891115	170	9.906819	431	10.093181	10.108885	10.202066	6
55	9.798091	261	9.891013	170	9.907077	431	10.092923	10.108987	10.201909	5
56	9.798247	261	9.890911	170	9.907336	431	10.092664	10.109089	10.201753	4
57	9.798403	260	9.890809	170	9.907594	431	10.092406	10.109191	10.201597	3
58	9.798560	260	9.890707	170	9.907852	431	10.092148	10.109293	10.201440	2
59	9.798716	260	9.890605	170	9.908111	431	10.091889	10 109395	10.201284	1
60	9.798872		9.890503		9.908369		10.091631	10.109497	10.201128	0
M	Co-sine.		Sine.		Co-tang.		Tang.	Co-sec.	Secant.	M

51 Degrees.

TABLE XIX.

LOGARITHMIC SINES, TANGENTS, AND SECANTS.

39 Degrees.

M	Sine.	Diff.	Co-sine.	D.	Tang.	Diff.	Co-tang.	Secant.	Co-sec.	M
0	9.798872	260	9.890503	170	9.908369	430	10.091631	10.109497	10.201128	60
1	9.799028	260	9.890400	171	9.908628	430	10.091372	10.109600	10.200972	59
2	9.799184	260	9.890298	171	9.908886	430	10.091114	10.109702	10.200816	58
3	9.799339	259	9.890195	171	9.909144	430	10.090856	10.109805	10.200661	57
4	9.799495	259	9.890093	171	9.909402	430	10.090598	10.109907	10.200505	56
5	9.799651	259	9.889990	171	9.909660	430	10.090340	10.110010	10.200349	55
6	9.799806	259	9.889888	171	9.909918	430	10.090082	10.110112	10.200194	54
7	9.799962	259	9.889785	171	9.910177	430	10.089823	10.110215	10.200038	53
8	9.800117	259	9.889682	171	9.910435	430	10.089565	10.110318	10.199883	52
9	9.800272	258	9.889579	171	9.910693	430	10.089307	10.110421	10.199728	51
10	9.800427	258	9.889477	171	9.910951	430	10.089049	10.110523	10.199573	50
11	9.800582	258	9.889374	172	9.911209	430	10.088791	10.110626	10.199418	49
12	9.800737	258	9.889271	172	9.911467	430	10.088533	10.110729	10.199263	48
13	9.800892	258	9.889168	172	9.911724	430	10.088276	10.110832	10.199108	47
14	9.801047	258	9.889064	172	9.911982	430	10.088018	10.110936	10.198953	46
15	9.801201	258	9.888961	172	9.912240	430	10.087760	10.111039	10.198799	45
16	9.801356	257	9.888858	172	9.912498	430	10.087502	10.111142	10.198644	44
17	9.801511	257	9.888755	172	9.912756	430	10.087244	10.111245	10.198489	43
18	9.801665	257	9.888651	172	9.913014	430	10.086986	10.111349	10.198335	42
19	9.801819	257	9.888548	172	9.913271	429	10.086729	10.111452	10.198181	41
20	9.801973	257	9.888444	173	9.913529	429	10.086471	10.111556	10.198027	40
21	9.802128	257	9.888341	173	9.913787	429	10.086213	10.111659	10.197872	39
22	9.802282	256	9.888237	173	9.914044	429	10.085956	10.111763	10.197718	38
23	9.802436	256	9.888134	173	9.914302	429	10.085698	10.111866	10.197564	37
24	9.802589	256	9.888030	173	9.914560	429	10.085440	10.111970	10.197411	36
25	9.802743	256	9.887926	173	9.914817	429	10.085183	10.112074	10.197257	35
26	9.802897	256	9.887822	173	9.915075	429	10.084925	10.112178	10.197103	34
27	9.803050	256	9.887718	173	9.915332	429	10.084668	10.112282	10.196950	33
28	9.803204	256	9.887614	173	9.915590	429	10.084410	10.112386	10.196796	32
29	9.803357	255	9.887510	173	9.915847	429	10.084153	10.112490	10.196643	31
30	9.803511	255	9.887406	174	9.916104	429	10.083896	10.112594	10.196489	30
31	9.803664	255	9.887302	174	9.916362	429	10.083638	10.112698	10.196336	29
32	9.803817	255	9.887198	174	9.916619	429	10.083381	10.112802	10.196183	28
33	9.803970	255	9.887093	174	9.916877	429	10.083123	10.112907	10.196030	27
34	9.804123	255	9.886989	174	9.917134	429	10.082866	10.113011	10.195877	26
35	9.804276	254	9.886885	174	9.917391	429	10.082609	10.113115	10.195724	25
36	9.804428	254	9.886780	174	9.917648	429	10.082352	10.113220	10.195572	24
37	9.804581	254	9.886676	174	9.917905	429	10.082095	10.113324	10.195419	23
38	9.804734	254	9.886571	174	9.918163	429	10.081837	10.113429	10.195266	22
39	9.804886	254	9.886466	174	9.918420	429	10.081580	10.113534	10.195114	21
40	9.805039	254	9.886362	175	9.918677	429	10.081323	10.113638	10.194961	20
41	9.805191	254	9.886257	175	9.918934	428	10.081066	10.113743	10.194809	19
42	9.805343	253	9.886152	175	9.919191	428	10.080809	10.113848	10.194657	18
43	9.805495	253	9.886047	175	9.919448	428	10.080552	10.113953	10.194505	17
44	9.805647	253	9.885942	175	9.919705	428	10.080295	10.114058	10.194353	16
45	9.805799	253	9.885837	175	9.919962	428	10.080038	10.114163	10.194201	15
46	9.805951	253	9.885732	175	9.920219	428	10.079781	10.114268	10.194049	14
47	9.806103	253	9.885627	175	9.920476	428	10.079524	10.114373	10.193897	13
48	9.806254	253	9.885522	175	9.920733	428	10.079267	10.114478	10.193746	12
49	9.806406	252	9.885416	175	9.920990	428	10.079010	10.114584	10.193594	11
50	9.806557	252	9.885311	176	9.921247	428	10.078753	10.114689	10.193443	10
51	9.806709	252	9.885205	176	9.921503	428	10.078497	10.114795	10.193291	9
52	9.806860	252	9.885100	176	9.921760	428	10.078240	10.114900	10.193140	8
53	9.807011	252	9.884994	176	9.922017	428	10.077983	10.115006	10.192989	7
54	9.807163	252	9.884889	176	9.922274	428	10.077726	10.115111	10.192837	6
55	9.807314	252	9.884783	176	9.922530	428	10.077470	10.115217	10.192686	5
56	9.807465	251	9.884677	176	9.922787	428	10.077213	10.115323	10.192535	4
57	9.807615	251	9.884572	176	9.923044	428	10.076956	10.115428	10.192385	3
58	9.807766	251	9.884466	176	9.923300	428	10.076700	10.115534	10.192234	2
59	9.807917	251	9.884360	176	9.923557	428	10.076443	10.115640	10.192083	1
60	9.808067		9.884254		9.923813		10.076187	10.115746	10.191933	0
M	Co-sine.		Sine.		Co-tang.		Tang.	Co-sec.	Secant.	M

50 Degrees.

TABLE XIX.

LOGARITHMIC SINES, TANGENTS, AND SECANTS.

38 Degrees.

M	Sine.	Diff.	Co-sine.	D.	Tang.	Diff.	Co-tang	Secant.	Co-sec.	M
0	9.789342	269	9.896532	164	9.892810	434	10.107190	10.103468	10.210658	60
1	9.789504	269	9.896433	165	9.893070	434	10.106930	10.103567	10.210496	59
2	9.789665	269	9.896335	165	9.893331	434	10 106669	10.103665	10.210335	58
3	9.789827	269	9.896236	165	9.893591	434	10.106409	10.103764	10.210173	57
4	9.789988	269	9.896137	165	9.893851	434	10.106149	10.103863	10.210012	56
5	9.790149	269	9.896038	165	9.894111	434	10.105889	10.103962	10.209851	55
6	9.790310	268	9.895939	165	9.894371	434	10.105629	10.104061	10.209690	54
7	9.790471	268	9.895840	165	9.894632	434	10.105368	10.104160	10.209529	53
8	9.790632	268	9.895741	165	9.894892	433	10.105108	10.104259	10.209368	52
9	9.790739	268	9.895641	165	9.895152	433	10.104848	10.104359	10.209207	51
10	9.790954	268	9.895542	165	9.895412	433	10.104588	10.104458	10.209046	50
11	9.791115	268	9.895443	166	9.895672	433	10.104328	10.104557	10.208885	49
12	9.791275	267	9.895343	166	9.895932	433	10.104068	10.104657	10.208725	48
13	9.791436	267	9.895244	166	9.896192	433	10.103808	10.104756	10.208564	47
14	9.791596	267	9.895145	166	9.896452	433	10.103548	10.104855	10.208404	46
15	9.791757	267	9.895045	166	9.896712	433	10.103288	10.104955	10.208243	45
16	9.791917	267	9.894945	166	9.896971	433	10.103029	10.105055	10.208083	44
17	9.792077	267	9.894846	166	9.897231	433	10.102769	10.105154	10.207923	43
18	9.792237	266	9.894746	166	9.897491	433	10.102509	10.105254	10.207763	42
19	9.792397	266	9.894646	166	9.897751	433	10.102249	10.105354	10.207603	41
20	9.792557	266	9.894546	166	9.898010	433	10.101990	10.105454	10.207443	40
21	9.792716	266	9.894446	167	9.898270	433	10.101730	10.105554	10.207284	39
22	9.792876	266	9.894346	167	9.898530	433	10.101470	10.105654	10.207124	38
23	9.793035	266	9.894246	167	9.898789	433	10.101211	10.105754	10.206965	37
24	9.793195	265	9.894146	167	9.899049	432	10.100951	10.105854	10.206805	36
25	9.793354	265	9.894046	167	9.899308	432	10.100692	10.105954	10.206646	35
26	9.793514	265	9.893946	167	9.899568	432	10.100432	10.106054	10.206486	34
27	9.793673	265	9.893846	167	9.899827	432	10.100173	10.106154	10.206327	33
28	9.793832	265	9.893745	167	9.900086	432	10.099914	10.106255	10.206168	32
29	9.793991	265	9.893645	167	9.900346	432	10.099654	10.106355	10.206009	31
30	9.794150	264	9.893544	167	9.900605	432	10.099395	10.106456	10.205850	30
31	9.794308	264	9.893444	168	9.900864	432	10.099136	10.106556	10.205692	29
32	9.794467	264	9.893343	168	9.901124	432	10.098876	10.106657	10.205533	28
33	9.794626	264	9.893243	168	9.901383	432	10.098617	10.106757	10.205374	27
34	9.794784	264	9.893142	168	9.901642	432	10.098358	10.106858	10.205216	26
35	9.794942	264	9.893041	168	9.901901	432	10.098099	10.106959	10.205058	25
36	9.795101	264	9.892940	168	9.902160	432	10.097840	10.107060	10.204899	24
37	9.795259	263	9.892839	168	9.902419	432	10.097581	10.107161	10.204741	23
38	9.795417	263	9.892739	168	9.902679	432	10.097321	10.107261	10.204583	22
39	9.795575	263	9.892638	168	9.902938	432	10.097062	10.107362	10.204425	21
40	9.795733	263	9.892536	168	9.903197	432	10.096803	10.107461	10.204267	20
41	9.795891	263	9.892435	169	9.903455	431	10.096545	10.107565	10.204109	19
42	9.796049	263	9.892334	169	9.903714	431	10.096286	10.107666	10.203951	18
43	9.796206	263	9.892233	169	9.903973	431	10.096027	10.107767	10.203794	17
44	9.796364	262	9.892132	169	9.904232	431	10.095768	10.107868	10.203636	16
45	9.796521	262	9.892030	169	9.904491	431	10.095509	10.107970	10.203479	15
46	9.796679	262	9.891929	169	9.904750	431	10.095250	10.108071	10.203321	14
47	9.796836	262	9.891827	169	9.905008	431	10.094992	10.108173	10.203164	13
48	9.796993	262	9.891726	169	9.905267	431	10.094733	10.108274	10.203007	12
49	9.797150	262	9.891624	169	9.905526	431	10.094474	10.108376	10.202850	11
50	9.797307	261	9.891523	169	9.905784	431	10.094216	10.108477	10.202693	10
51	9.797464	261	9.891421	170	9.906043	431	10.093957	10.108579	10.202536	9
52	9.797621	261	9.891319	170	9.906302	431	10.093698	10.108681	10.202379	8
53	9.797777	261	9.891217	170	9.906560	431	10.093440	10.108783	10.202223	7
54	9.797934	261	9.891115	170	9.906819	431	10.093181	10.108885	10.202066	6
55	9.798091	261	9.891013	170	9.907077	431	10.092923	10.108987	10.201909	5
56	9.798247	261	9.890911	170	9.907336	431	10.092664	10.109089	10.201753	4
57	9.798403	260	9.890809	170	9.907594	431	10.092406	10.109191	10.201597	3
58	9.798560	260	9.890707	170	9.907852	431	10.092148	10.109293	10.201440	2
59	9.798716	260	9.890605	170	9.908111	431	10.091889	10.109395	10.201284	1
60	9.798872		9.890503		9.908369		10.091631	10.109497	10.201128	0
M	Co-sine.		Sine.		Co-tang.		Tang.	Co-sec.	Secant.	M

51 Degrees.

TABLE XIX.

LOGARITHMIC SINES, TANGENTS, AND SECANTS.

39 Degrees.

M	Sine.	Diff.	Co-sine.	D.	Tang.	Diff.	Co-tang.	Secant.	Co-sec.	M
0	9.798872	260	9.890503	170	9.908369	430	10.091631	10.109497	10.201128	60
1	9.799028	260	9.890400	171	9.908628	430	10.091372	10.109600	10.200972	59
2	9.799184	260	9.890298	171	9.908886	430	10.091114	10.109702	10.200816	58
3	9.799339	259	9.890195	171	9.909144	430	10.090856	10.109805	10.200661	57
4	9.799495	259	9.890093	171	9.909402	430	10.090598	10.109907	10.200505	56
5	9.799651	259	9.889990	171	9.909660	430	10.090340	10.110010	10.200349	55
6	9.799806	259	9.889888	171	9.909918	430	10.090082	10.110112	10.200194	54
7	9.799962	259	9.889785	171	9.910177	430	10.089823	10.110215	10.200038	53
8	9.800117	259	9.889682	171	9.910435	430	10.089565	10.110318	10.199883	52
9	9.800272	258	9.889579	171	9.910693	430	10.089307	10.110421	10.199728	51
10	9.800427	258	9.889477	171	9.910951	430	10.089049	10.110523	10.199573	50
11	9.800582	258	9.889374	172	9.911209	430	10.088791	10.110626	10.199418	49
12	9.800737	258	9.889271	172	9.911467	430	10.088533	10.110729	10.199263	48
13	9.800892	258	9.889168	172	9.911724	430	10.088276	10.110832	10.199108	47
14	9.801047	258	9.889064	172	9.911982	430	10.088018	10.110936	10.198953	46
15	9.801201	258	9.888961	172	9.912240	430	10.087760	10.111039	10.198799	45
16	9.801356	257	9.888858	172	9.912498	430	10.087502	10.111142	10.198644	44
17	9.801511	257	9.888755	172	9.912756	430	10.087244	10.111245	10.198489	43
18	9.801665	257	9.888651	172	9.913014	430	10.086986	10.111349	10.198335	42
19	9.801819	257	9.888548	172	9.913271	429	10.086729	10.111452	10.198181	41
20	9.801973	257	9.888444	173	9.913529	429	10.086471	10.111556	10.198027	40
21	9.802128	257	9.888341	173	9.913787	429	10.086213	10.111659	10.197872	39
22	9.802282	256	9.888237	173	9.914044	429	10.085956	10.111763	10.197718	38
23	9.802436	256	9.888134	173	9.914302	429	10.085698	10.111866	10.197564	37
24	9.802589	256	9.888030	173	9.914560	429	10.085440	10.111970	10.197411	36
25	9.802743	256	9.887926	173	9.914817	429	10.085183	10.112074	10.197257	35
26	9.802897	256	9.887822	173	9.915075	429	10.084925	10.112178	10.197103	34
27	9.803050	256	9.887718	173	9.915332	429	10.084668	10.112282	10.196950	33
28	9.803204	256	9.887614	173	9.915590	429	10.084410	10.112386	10.196796	32
29	9.803357	255	9.887510	173	9.915847	429	10.084153	10.112490	10.196643	31
30	9.803511	255	9.887406	174	9.916104	429	10.083896	10.112594	10.196489	30
31	9.803664	255	9.887302	174	9.916362	429	10.083638	10.112698	10.196336	29
32	9.803817	255	9.887198	174	9.916619	429	10.083381	10.112802	10.196183	28
33	9.803970	255	9.887093	174	9.916877	429	10.083123	10.112907	10.196030	27
34	9.804123	255	9.886989	174	9.917134	429	10.082866	10.113011	10.195877	26
35	9.804276	254	9.886885	174	9.917391	429	10.082609	10.113115	10.195724	25
36	9.804428	254	9.886780	174	9.917648	429	10.082352	10.113220	10.195572	24
37	9.804581	254	9.886676	174	9.917905	429	10.082095	10.113324	10.195419	23
38	9.804734	254	9.886571	174	9.918163	429	10.081837	10.113429	10.195266	22
39	9.804886	254	9.886466	174	9.918420	429	10.081580	10.113534	10.195114	21
40	9.805039	254	9.886362	175	9.918677	429	10.081323	10.113638	10.194961	20
41	9.805191	254	9.886257	175	9.918934	428	10.081066	10.113743	10.194809	19
42	9.805343	253	9.886152	175	9.919191	428	10.080809	10.113848	10.194657	18
43	9.805495	253	9.886047	175	9.919448	428	10.080552	10.113953	10.194505	17
44	9.805647	253	9.885942	175	9.919705	428	10.080295	10.114058	10.194353	16
45	9.805799	253	9.885837	175	9.919962	428	10.080038	10.114163	10.194201	15
46	9.805951	253	9.885732	175	9.920219	428	10.079781	10.114268	10.194049	14
47	9.806103	253	9.885627	175	9.920476	428	10.079524	10.114373	10.193897	13
48	9.806254	253	9.885522	175	9.920733	428	10.079267	10.114478	10.193746	12
49	9.806406	252	9.885416	175	9.920990	428	10.079010	10.114584	10.193594	11
50	9.806557	252	9.885311	176	9.921247	428	10.078753	10.114689	10.193443	10
51	9.806709	252	9.885205	176	9.921503	428	10.078497	10.114795	10.193291	9
52	9.806860	252	9.885100	176	9.921760	428	10.078240	10.114900	10.193140	8
53	9.807011	252	9.884994	176	9.922017	428	10.077983	10.115006	10.192989	7
54	9.807163	252	9.884889	176	9.922274	428	10.077726	10.115111	10.192837	6
55	9.807314	252	9.884783	176	9.922530	428	10.077470	10.115217	10.192686	5
56	9.807465	251	9.884677	176	9.922787	428	10.077213	10.115323	10.192535	4
57	9.807615	251	9.884572	176	9.923044	428	10.076956	10.115428	10.192385	3
58	9.807766	251	9.884466	176	9.923300	428	10.076700	10.115534	10.192234	2
59	9.807917	251	9.884360	176	9.923557	428	10.076443	10.115640	10.192083	1
60	9.808067		9.884254		9.923813		10.076187	10.115746	10.191933	0
M	Co-sine.		Sine.		Co-tang.		Tang.	Co-sec.	Secant.	M

50 Degrees.

TABLE XIX.

LOGARITHMIC SINES, TANGENTS, AND SECANTS.

40 Degrees.

M	Sine.	Diff.	Co-sine.	D.	Tang.	Diff	Co-tang.	Secant.	Co-sec.	M
0	9.808067	251	9.884254	177	9.923813	428	10.076187	10.115746	10.191933	60
1	9.808218	251	9.884148	177	9.924070	428	10.075930	10.115852	10.191782	59
2	9.808368	251	9.884042	177	9.924327	428	10.075673	10.115958	10.191632	58
3	9.808519	250	9.883936	177	9.924583	427	10.075417	10.116064	10.191481	57
4	9.808669	250	9.883829	177	9.924840	427	10.075160	10.116171	10.191331	56
5	9.808819	250	9.883723	177	9.925096	427	10.074904	10.116277	10.191181	55
6	9.808969	250	9.883617	177	9.925352	427	10.074648	10.116383	10.191031	54
7	9.809119	250	9.883510	177	9.925609	427	10.074391	10.116490	10.190881	53
8	9.809269	250	9.883404	177	9.925865	427	10.074135	10.116596	10.190731	52
9	9.809419	249	9.883297	178	9.926122	427	10.073878	10.116703	10.190581	51
10	9.809569	249	9.883191	178	9.926378	427	10.073622	10.116809	10.190431	50
11	9.809718	249	9.883084	178	9.926634	427	10.073366	10.116916	10.190282	49
12	9.809868	249	9.882977	178	9.926890	427	10.073110	10.117023	10.190132	48
13	9.810017	249	9.882871	178	9.927147	427	10.072853	10.117129	10.189983	47
14	9.810167	249	9.882764	178	9.927403	427	10.072597	10.117236	10.189833	46
15	9.810316	248	9.882657	178	9.927659	427	10.072341	10.117343	10.189684	45
16	9.810465	248	9.882550	178	9.927915	427	10.072085	10.117450	10.189535	44
17	9.810614	248	9.882443	178	9.928171	427	10.071829	10.117557	10.189386	43
18	9.810763	248	9.882336	179	9.928427	427	10.071573	10.117664	10.189237	42
19	9.810912	248	9.882229	179	9.928683	427	10.071317	10.117771	10.189088	41
20	9.811061	248	9.882121	179	9.928940	427	10.071060	10.117879	10.188939	40
21	9.811210	248	9.882014	179	9.929196	427	10.070804	10.117986	10.188790	39
22	9.811358	247	9.881907	179	9.929452	427	10.070548	10.118093	10.188642	38
23	9.811507	247	9.881799	179	9.929708	427	10.070292	10.118201	10.188493	37
24	9.811655	247	9.881692	179	9.929964	427	10.070036	10.118308	10.188345	36
25	9.811804	247	9.881584	179	9.930220	427	10.069780	10.118416	10.188196	35
26	9.811952	247	9.881477	179	9.930475	427	10.069525	10.118523	10.188048	34
27	9.812100	247	9.881369	179	9.930731	426	10.069169	10.118631	10.187900	33
28	9.812248	247	9.881261	180	9.930987	426	10.069013	10.118739	10.187752	32
29	9.812396	246	9.881153	180	9.931243	426	10.068757	10.118847	10.187604	31
30	9.812544	246	9.881046	180	9.931499	426	10.068501	10.118954	10.187456	30
31	9.812692	246	9.880938	180	9.931755	426	10.068245	10.119062	10.187308	29
32	9.812840	246	9.880830	180	9.932010	426	10.067990	10.119170	10.187160	28
33	9.812988	246	9.880722	180	9.932266	426	10.067734	10.119278	10.187012	27
34	9.813135	246	9.880613	180	9.932522	426	10.067478	10.119387	10.186865	26
35	9.813283	246	9.880505	180	9.932778	426	10.067222	10.119495	10.186717	25
36	9.813430	245	9.880397	180	9.933033	426	10.066967	10.119603	10.186570	24
37	9.813578	245	9.880289	181	9.933289	426	10.066711	10.119711	10.186422	23
38	9.813725	245	9.880180	181	9.933545	426	10.066455	10.119820	10.186275	22
39	9.813872	245	9.880072	181	9.933800	426	10.066200	10.119928	10.186128	21
40	9.814019	245	9.879963	181	9.934056	426	10.065944	10.120037	10.185981	20
41	9.814166	245	9.879855	181	9.934311	426	10.065689	10.120145	10.185834	19
42	9.814313	245	9.879746	181	9.934567	426	10.065433	10.120254	10.185687	18
43	9.814460	244	9.879637	181	9.934823	426	10.065177	10.120363	10.185540	17
44	9.814607	244	9.879529	181	9.935078	426	10.064922	10.120471	10.185393	16
45	9.814753	244	9.879420	181	9.935333	426	10.064667	10.120580	10.185247	15
46	9.814900	241	9.879311	181	9.935589	426	10.064411	10.120689	10.185100	14
47	9.815046	244	9.879202	182	9.935844	426	10.064156	10.120798	10.184954	13
48	9.815193	244	9.879093	182	9.936100	426	10.063900	10.120907	10.184807	12
49	9.815339	244	9.878984	182	9.936355	426	10.063645	10.121016	10.184661	11
50	9.815485	243	9.878875	182	9.936610	426	10.063390	10.121125	10.184515	10
51	9.815632	243	9.878766	182	9.936866	426	10.063134	10.121234	10.184368	9
52	9.815778	243	9.878656	182	9.937121	426	10.062879	10.121344	10.184222	8
53	9.815924	243	9.878547	182	9.937376	425	10.062624	10.121453	10.184076	7
54	9.816069	243	9.878438	182	9.937632	425	10.062368	10.121562	10.183931	6
55	9.816215	243	9.878328	182	9.937887	425	10.062113	10.121672	10.183785	5
56	9.816361	243	9.878219	183	9.938142	425	10.061858	10.121781	10.183639	4
57	9.816507	242	9.878109	183	9.938398	425	10.061602	10.121891	10.183493	3
58	9.816652	242	9.877999	183	9.938653	425	10.061347	10.122001	10.183348	2
59	9.816798	242	9.877890	183	9.938908	425	10.061092	10.122110	10.183202	1
60	9.816943		9.877780		9.939163		10.060837	10.122220	10.183057	0
M	Co-sine.		Sine.		Co-tang.		Tang.	Co-sec.	Secant.	M

49 Degrees.

TABLE XIX.

LOGARITHMIC SINES, TANGENTS, AND SECANTS.

41 Degrees.

M	Sine.	Diff.	Co-sine.	D.	Tang.	Diff.	Co-tang.	Secant.	Co-sec.	M
0	9.816943	242	9.877780	183	9.939163	425	10.060837	10.122220	10.183057	60
1	9.817088	242	9.877670	183	9.939418	425	10.060582	10.122330	10.182912	59
2	9.817233	242	9.877560	183	9.939673	425	10.060327	10.122440	10.182767	58
3	9.817379	242	9 877450	183	9.939928	425	10.060072	10.122550	10.182621	57
4	9.817524	241	9.877340	183	9.940183	425	10.059817	10.122660	10.182476	56
5	9.817668	241	9.877230	184	9.940438	425	10.059562	10.122770	10.182332	55
6	9.817813	241	9.877120	184	9.940694	425	10.059306	10.122880	10.182187	54
7	9.817958	241	9.877010	184	9.940949	425	10.059051	10.122990	10.182042	53
8	9.818103	241	9.876899	184	9.941204	425	10.058796	10.123101	10.181897	52
9	9.818247	241	9.876789	184	9.941458	425	10.058542	10.123211	10.181753	51
10	9.818392	241	9.876678	184	9.941714	425	10.058286	10.123322	10.181608	50
11	9.818536	240	9.876568	184	9.941968	425	10.058032	10.123432	10.181464	49
12	9.818681	240	9.876457	184	9.942223	425	10.057777	10.123543	10.181319	48
13	9.818825	240	9.876347	184	9.942478	425	10.057522	10.123653	10.181175	47
14	9.818969	·240	9.876236	185	9.942733	425	10.057267	10.123764	10.181031	46
15	9.819113	240	9.876125	185	9.942988	425	10.057012	10.123875	10.180887	45
16	9·819257	240	9.876014	185	9.943243	425	10.056757	10.123986	10.180743	44
17	9.819401	240	9.875904	185	9.943498	425	10.056502	10.124096	10.180599	43
18	9.819545	239	9.875793	185	9.943752	425	10.056248	10.124207	10.180455	42
19	9.819689	239	9.875682	185	9.944007	425	10.055993	10.124318	10.180311	41
20	9.819832	239	9.875571	185	9.944262	425	10.055738	10.124429	10.180168	40
21	9.819976	239	9.875459	185	9.944517	425	10.055483	10.124541	10.180024	39
22	9.820120	239	9.875348	185	9.944771	425	10.055229	10.124652	10.179880	38
23	9.820263	239	9.875237	185	9.945026	425	10.054974	10.124763	10.179737	37
24	9.820406	239	9.875126	186	9.945281	425	10.054719	10.124874	10.179594	36
25	9.820550	238	9.875014	186	9.945535	425	10.054465	10.124986	10.179450	35
26	9.820693	238	9.874903	186	9.945790	425	10.054210	10.125097	10.179307	34
27	9.820836	238	9.874791	186	9.946045	425	10.053955	10.125209	10.179164	33
28	9.820979	238	9.874680	186	9.946299	425	10.053701	10.125320	10.179021	32
29	9.821122	238	9.874568	186	9.946554	425	10.053446	10.125432	10.178878	31
30	9.821265	238	9.874456	186	9.946808	425	10.053192	10.125544	10.178735	30
31	9.821407	238	9.874344	186	9.947063	424	10.052937	10.125656	10.178593	29
32	9.821550	238	9.874232	186	9.947318	424	10.052682	10.125768	10.178450	28
33	9.821693	237	9.874121	187	9.947572	424	10.052428	10.125879	10.178307	27
34	9.821835	237	9.874009	187	9.947826	424	10.052174	10.125991	10.178165	26
35	9.821977	237	9.873896	187	9.948081	424	10.051919	10.126104	10.178023	25
36	9.822120	237	9.873784	187	9.948336	424	10.051664	10.126216	10.177880	24
37	9.822262	237	9.873672	187	9.948590	424	10.051410	10.126328	10.177738	23
38	9.822404	237	9.873560	187	9.948844	424	10.051156	10.126440	10.177596	22
39	9.822546	237	9.873448	187	9.949099	424	10.050901	10.126552	10.177454	21
40	9.822688	236	9.873335	187	9.949353	424	10.050647	10.126665	10.177312	20
41	9.822830	236	9.873223	187	9.949607	424	10.050393	10.126777	10.177170	19
42	9.822972	236	9.873110	188	9.949862	424	10.050138	10.126890	10.177028	18
43	9.823114	236	9.872998	188	9.950116	424	10.049884	10.127002	10.176886	17
44	9.823255	236	9.872885	188	9.950370	424	10.049630	10.127115	10.176745	16
45	9.823397	236	9.872772	188	9.950625	424	10.049375	10.127228	10.176603	15
46	9.823539	236	9.872659	188	9.950879	424	10.049121	10.127341	10.176461	14
47	9.823680	235	9.872547	188	9.951133	424	10.048867	10.127453	10.176320	13
48	9.823821	235	9.872434	188	9.951388	424	10.048612	10.127566	10.176179	12
49	9.823963	235	9.872321	188	9.951642	424	10.048358	10.127679	10.176037	11
50	9.824104	235	9.872208	188	9.951896	424	10.048104	10.127792	10.175896	10
51	9.824245	235	9.872095	189	9.952150	424	10.047850	10.127905	10.175755	9
52	9.824386	235	9.871981	189	9.952405	424	10.047595	10.128019	10.175614	8
53	9.824527	235	9.871868	189	9.952659	424	10.047341	10.128132	10.175473	7
54	9.824668	234	9.871755	189	9.952913	424	10.047087	10.128245	10.175332	6
55	9.824808	234	9.871641	189	9.953167	423	10.046833	10.128359	10.175192	5
56	9.824949	234	9.871528	189	9.953421	423	10.046579	10.128472	10.175051	4
57	9.825090	234	9.871414	189	9.953675	423	10.046325	10.128586	10.174910	3
58	9.825230	234	9.871301	189	9.953929	423	10.046071	10.128699	10.174770	2
59	9.825371	234	9.871187	189	9.954183	423	10.045817	10.128813	10.174629	1
60	9.825511		9.871073		9.954437		10.045563	10.128927	10.174489	0
M	Co-sine.		Sine.		Co-tang.		Tang.	Co-sec.	Secant.	M

48 Degrees.

TABLE XIX.

LOGARITHMIC SINES, TANGENTS, AND SECANTS.

42 Degrees.

M	Sine.	Diff.	Co-sine.	D.	Tang.	Diff.	Co-tang.	Secant.	Co-sec.	M
0	9.825511	234	9.871073	190	9.954437	423	10.045563	10.128927	10.174489	60
1	9.825651	233	9.870960	190	9.954691	423	10.045309	10.129040	10.174349	59
2	9.825791	233	9.870846	190	9.954945	423	10.045055	10.129154	10.174209	58
3	9.825931	233	9.870732	190	9.955200	423	10.044800	10.129268	10.174069	57
4	9.826071	233	9.870618	190	9.955454	423	10.044546	10.129382	10.173929	56
5	9.826211	233	9.870504	190	9.955707	423	10.044293	10.129496	10.173789	55
6	9.826351	233	9.870390	190	9.955961	423	19.044039	10.129610	10.173649	54
7	9.826491	233	9.870276	190	9.956215	423	10.043785	10.129724	10.173509	53
8	9.826631	233	9.870161	190	9.956469	423	10.043531	10.129839	10.173369	52
9	9.826770	232	9.870047	191	9.956723	423	10.043277	10.129953	10.173230	51
10	9.826910	232	9.869933	191	9.956977	423	10.043023	10.130067	10.173090	50
11	9.827049	232	9.869818	191	9.957231	423	10.042769	10.130182	10.172951	49
12	9.827189	232	9.869704	191	9.957485	423	10.042515	10.130296	10.172811	48
13	9.827328	232	9.869589	191	9.957739	423	10.042261	10.130411	10.172672	47
14	9.827467	232	9.869474	191	9.957993	423	10.042007	10.130526	10.172533	46
15	9.827606	232	9.869360	191	9.958246	423	10.041754	10.130640	10.172394	45
16	9.827745	232	9.869245	191	9.958500	423	10.041500	10.130755	10.172255	44
17	9.827884	231	9.869130	191	9.958754	423	10.041246	10.130870	10.172116	43
18	9.828023	231	9.869015	192	9.959008	423	10.040992	10.130985	10.171977	42
19	9.828162	231	9.868900	192	9.959262	423	10.040738	10.131100	10.171838	41
20	9.828301	231	9.868785	192	9.959516	423	10.040484	10.131215	10.171699	40
21	9.828439	231	9.868670	192	9.959769	423	10.040231	10.131330	10.171561	39
22	9.828578	231	9.868555	192	9.960023	423	10.039977	10.131445	10.171422	38
23	9.828716	231	9.868440	192	9.960277	423	10.039723	10.131560	10.171284	37
24	9.828855	230	9.868324	192	9.960531	423	10.039469	10.131676	10.171145	36
25	9.828993	230	9.868209	192	9.960784	423	10.039216	10.131791	10.171007	35
26	9.829131	230	9.868093	192	9.961038	423	10.038962	10.131907	10.170869	34
27	9.629269	230	9.867978	193	9.961291	423	10.038709	10.132022	10.170731	33
28	9.829407	230	9.867862	193	9.961545	423	10.038455	10.132138	10.170593	32
29	9.829545	230	9.867747	193	9.961799	423	10.038201	10.132253	10.170455	31
30	9.829683	230	9.867631	193	9.962052	423	10.037948	10.132369	10.170317	30
31	9.829821	229	9.867515	193	9.962306	423	10.037694	10.132485	10.170179	29
32	9.829959	229	9.867399	193	9.962560	423	10.037440	10.132601	10.170041	28
33	9.830097	229	9.867283	193	9.962813	423	10.037187	10.132717	10.169903	27
34	9.830234	229	9.867167	193	9.963067	423	10.036933	10.132833	10.169766	26
35	9.830372	229	9.867051	193	9.963320	423	10.036680	10.132949	10.169628	25
36	9.830509	229	9.866935	194	9.963574	423	10.036426	10.133065	10.169491	24
37	9.830646	229	9.866819	194	9.963827	423	10.036173	10.133181	10.169354	23
38	9.830784	229	9.866703	194	9.964081	423	10.035919	10.133297	10.169216	22
39	9.830921	228	9.866586	194	9.964335	423	10.035665	10.133414	10.169079	21
40	9.831058	228	9.866470	194	9.964588	422	10.035412	10.133530	10.168942	20
41	9.831195	228	9.866353	194	9.964842	422	10.035158	10.133647	10.168805	19
42	9.831332	228	9.866237	194	9.965095	422	10.034905	10.133763	10.168668	18
43	9.831469	228	9.866120	194	9.965349	422	10.034651	10.133880	10.168531	17
44	9.831606	228	9.866004	195	9.965602	422	10.034398	10.133996	10.168394	16
45	9.831742	228	9.865887	195	9.965855	422	10.034145	10.134113	10.168258	15
46	9.831879	228	9.865770	195	9.966109	422	10.033891	10.134230	10.168121	14
47	9.832015	227	9.865653	195	9.966362	422	10.033638	10.134347	10.167985	13
48	9.832152	227	9.865536	195	9.966616	422	10.033384	10.134464	10.167848	12
49	9.832288	227	9.865419	195	9.966869	422	10.033131	10.134581	10.167712	11
50	9.832425	227	9.865302	195	9.967123	422	10.032877	10.134698	10.167575	10
51	9.832561	227	9.865185	195	9.967376	422	10.032624	10.134815	10.167439	9
52	9.832697	227	9.865068	195	9.967629	422	10.032371	10.134932	10.167303	8
53	9.832833	227	9.864950	195	9.967883	422	10.032117	10.135050	10.167167	7
54	9.832969	226	9.864833	196	9.968136	422	10.031864	10.135167	10.167031	6
55	9.833105	226	9.864716	196	9.968389	422	10.031611	10.135284	10.166895	5
56	9.833241	226	9.864598	196	9.968643	422	10.031357	10.135402	10.166759	4
57	9.833377	226	9.864481	196	9.968896	422	10.031104	10.135519	10.166623	3
58	9.833512	226	9.864363	196	9.969149	422	10.030851	10.135637	10.166488	2
59	9.833648	226	9.864245	196	9.969403	422	10.030597	10.135755	10.166352	1
60	9.833783		9.864127		9.969656		10.030344	10.135873	10.166217	0
M	Co-sine.		Sine.		Co-tang.		Tang.	Co-sec.	Secant	M

47 Degrees.

LOGARITHMIC SINES, TANGENTS, AND SECANTS.

43 Degrees.

M	Sine.	Diff.	Co-sine.	D.	Tang.	Diff.	Co-tang.	Secant.	Co-sec.	M
0	9.833783	226	9.864127	196	9.969656	422	10.030344	10.135873	10.166217	60
1	9.833919	225	9.864010	196	9.969909	422	10.030091	10.135990	10.166081	59
2	9.834054	225	9.863892	197	9.970162	422	10.029838	10.136108	10.165946	58
3	9.834189	225	9.863774	197	9.970416	422	10.029584	10.136226	10.165811	57
4	9.834325	225	9.863656	197	9.970669	422	10.029331	10.136344	10.165675	56
5	9.834460	225	9.863538	197	9.970922	422	10.029078	10.136462	10.165540	55
6	9.834595	225	9.863419	197	9.971175	422	10.028825	10.136581	10.165405	54
7	9.834730	225	9.863301	197	9.971429	422	10.028571	10.136699	10.165270	53
8	9.834865	225	9.863183	197	9.971682	422	10.028318	10.136817	10.165135	52
9	9.834999	224	9.863064	197	9.971935	422	10.028065	10.136936	10.165001	51
10	9.835134	224	9.862946	198	9.972188	422	10.027812	10.137054	10.164866	50
11	9.835269	224	9.862827	198	9.972441	422	10.027559	10.137173	10.164731	49
12	9.835403	224	9.862709	198	9.972694	422	10.027306	10.137291	10.164597	48
13	9.835538	224	9.862590	198	9.972948	422	10.027052	10.137410	10.164462	47
14	9.835672	224	9.862471	198	9.973201	422	10.026799	10.137529	10.164328	46
15	9.835807	224	9.862353	198	9.973454	422	10.026546	10.137647	10.164193	45
16	9.835941	224	9.862234	198	9.973771	422	10.026293	10.137766	10.164059	44
17	9.836075	223	9.862115	198	9.973960	422	10.026040	10.137885	10.163925	43
18	9.836209	223	9.861996	198	9.974213	422	10.025787	10.138004	10.163791	42
19	9.836343	223	9.861877	198	9.974466	422	10.025534	10.138123	10.163657	41
20	9.836477	223	9.861758	199	9.974719	422	10.025281	10.138242	10.163523	40
21	9.836611	223	9.861638	199	9.974973	422	10.025027	10.138362	10.163389	39
22	9.836745	223	9.861519	199	9.975226	422	10.024774	10.138481	10.163255	38
23	9.836878	223	9.861400	199	9.975479	422	10.024521	10.138600	10.163122	37
24	9.837012	222	9.861280	199	9.975732	422	10.024268	10.138720	10.162988	36
25	9.837146	222	9.861161	199	9.975985	422	10.024015	10.138839	10.162854	35
26	9.837279	222	9.861041	199	9.976238	422	10.023762	10.138959	10.162721	34
27	9.837412	222	9.860922	199	9.976491	422	10.023509	10.139078	10.162588	33
28	9.837546	222	9.860802	199	9.976744	422	10.023256	10.139198	10.162454	32
29	9.837679	222	9.860682	200	9.976997	422	10.023003	10.139318	10.162321	31
30	9.837812	222	9.860562	200	9.977250	422	10.022750	10.139438	10.162188	30
31	9.837945	222	9.860442	200	9.977503	422	10.022497	10.139558	10.162055	29
32	9.838078	221	9.860322	200	9.977756	422	10.022244	10.139678	10.161922	28
33	9.838211	221	9.860202	200	9.978009	422	10.021991	10.139798	10.161789	27
34	9.838344	221	9.860082	200	9.978262	422	10.021738	10.139918	10.161656	26
35	9.838477	221	9.859962	200	9.978515	422	10.021485	10.140038	10.161523	25
36	9.838610	221	9.859842	200	9.978768	422	10.021232	10.140158	10.161390	24
37	9.838742	221	9.859721	201	9.979021	422	10.020979	10.140279	10.161258	23
38	9.838875	221	9.859601	201	9.979274	422	10.020726	10.140399	10.161125	22
39	9.839007	221	9.859480	201	9.979527	422	10.020473	10.140520	10.160993	21
40	9.839140	220	9.859360	201	9.979780	422	10.020220	10.140640	10.160860	20
41	9.839272	220	9.859239	201	9.980033	422	10.019967	10.140761	10.160728	19
42	9.839404	220	9.859119	201	9.980286	422	10.019714	10.140881	10.160596	18
43	9.839536	220	9.858998	201	9.980538	422	10.019462	10.141002	10.160464	17
44	9.839668	220	9.858877	201	9.980791	422	10.019209	10.141123	10.160332	16
45	9.839800	220	9.858756	202	9.981044	422	10.018956	10.141244	10.160200	15
46	9.839932	220	9.858635	202	9.981297	422	10.018703	10.141365	10.160068	14
47	9.840064	219	9.858514	202	9.981550	422	10.018450	10.141486	10.159936	13
48	9.840196	219	9.858393	202	9.981803	422	10.018197	10.141607	10.159804	12
49	9.840328	219	9.858272	202	9.982056	422	10.017944	10.141728	10.159672	11
50	9.840459	219	9.858151	202	9.982309	421	10.017691	10.141849	10.159541	10
51	9.840591	219	9.858029	202	9.982562	421	10.017438	10.141971	10.159409	9
52	9.840722	219	9.857908	202	9.982814	421	10.017186	10.142092	10.159278	8
53	9.840854	219	9.857786	202	9.983067	421	10.016933	10.142214	10.159146	7
54	9.840985	219	9.857665	203	9.983320	421	10.016680	10.142335	10.159015	6
55	9.841116	218	9.857543	203	9.983573	421	10.016427	10.142457	10.158884	5
56	9.841247	218	9.857422	203	9.983826	421	10.016174	10.142578	10.158753	4
57	9.841378	218	9.857300	203	9.984079	421	10.015921	10.142700	10.158622	3
58	9.841509	218	9.857178	203	9.984331	421	10.015669	10.142822	10.158491	2
59	9.841640	218	9.857056	203	9.984584	421	10.015416	10.142944	10.158360	1
60	9.841771		9.856934		9.984837		10.015163	10.143066	10.158229	0
M	Co-sine.		Sine.		Co-tang.		Tang.	Co-sec.	Secant.	M

46 Degrees.

TABLE XIX·

LOGARITHMIC SINES, TANGENTS, AND SECANTS.

44 Degrees.

M	Sine.	Diff.	Co-sine.	D.	Tang.	Diff.	Co-tang.	Secant.	Co-sec.	M
0	9.841771	218	9.856934	204	9.984837	421	10.015163	10.143066	10.158229	60
1	9.841902	218	9.856812	204	9.985090	421	10.014910	10.143188	10.158098	59
2	9.842033	218	9.856690	204	9.985343	421	10.014657	10.143310	10.157967	58
3	9.842163	217	9.856568	204	9.985596	421	10.014404	10.143432	10.157837	57
4	9.842294	217	9.856446	204	9.985848	421	10.014152	10.143554	10.157706	56
5	9.842424	217	9.856323	204	9.986101	421	10.013899	10.143677	10.157576	55
6	9.842555	217	9.856201	204	9.986354	421	10.013646	10.143799	10.157445	54
7	9.842685	217	9.856078	204	9.986607	421	10.013393	10.143922	10.157315	53
8	9.842815	217	9.855956	204	9.986860	421	10.013140	10.144044	10.157185	52
9	9.842946	217	9.855833	204	9.987112	421	10.012888	10.144167	10.157054	51
10	9.843076	217	9.855711	205	9.987365	421	10.012635	10.144289	10.156924	50
11	9.843206	216	9.855588	205	9.987618	421	10.012382	10.144412	10.156794	49
12	9.843336	216	9.855465	205	9.987871	421	10.012129	10.144535	10.156664	48
13	9.843466	216	9.855342	205	9.988123	421	10.011877	10.144658	10.156534	47
14	9.843595	216	9.855219	205	9.988376	421	10.011624	10.144781	10.156405	46
15	9.843725	216	9.855096	205	9.988629	421	10.011371	10.144904	10.156275	45
16	9.843855	216	9.854973	205	9.988882	421	10.011118	10.145027	10.156145	44
17	9.843984	216	9.854850	205	9.989134	421	10.010866	10.145150	10.156016	43
18	9.844114	216	9.854727	206	9.989387	421	10 010613	10.145273	10.155886	42
19	9.844243	215	9.854603	206	9.989640	421	10.010360	10.145397	10.155757	41
20	9.844372	215	9.854480	206	9.989893	421	10.010107	10.145520	10.155628	40
21	9.844502	215	9.854356	206	9.990145	421	10.009855	10.145644	10.155498	39
22	9.844631	215	9.854233	206	9.990398	421	10.009602	10.145767	10.155369	38
23	9.844760	215	9.854109	206	9.990651	421	10.009349	10.145891	10.155240	37
24	9.844889	215	9.853986	206	9.990903	421	10.009097	10.146014	10.155111	36
25	9.845018	215	9.853862	206	9.991156	421	10.008844	10.146138	10.154982	35
26	9.845147	215	9.853738	206	9.991409	421	10.008591	10.146262	10.154853	34
27	9.845276	214	9.853614	207	9.991662	421	10.008338	10.146386	10.154724	33
28	9.845405	214	9.853490	207	9.991914	421	10.008086	10.146510	10.154595	32
29	9.845533	214	9.853366	207	9.992167	421	10.007833	10.146634	10.154467	31
30	9.845662	214	9.853242	207	9.992420	421	10.007580	10.146758	10.154338	30
31	9.845790	214	9.853118	207	9.992672	421	10.007328	10.146882	10.154210	29
32	9.845919	214	9.852994	207	9.992925	421	10.007075	10.147006	10.154081	28
33	9.846047	214	9.852869	207	9.993178	421	10.006822	10.147131	10.153953	27
34	9.846175	214	9.852745	207	9.993430	421	10.006570	10.147255	10.153825	26
35	9.846304	214	9.852620	207	9.993683	421	10.006317	10.147380	10.153696	25
36	9.846432	213	9.852496	208	9.993936	421	10.006064	10.147504	10.153568	24
37	9.846560	213	9.852371	208	9.994189	421	10.005811	10.147629	10.153440	23
38	9.846688	213	9.852247	208	9.994441	421	10.005559	10.147753	10.153312	22
39	9.846816	213	9 852122	208	9.994694	421	10.005306	10.147878	10.153184	21
40	9.846944	213	9.851997	208	9.994947	421	10.005053	10.148003	10.153056	20
41	9.847071	213	9.851872	208	9.995199	421	10.004801	10.148128	10.152929	19
42	9.847199	213	9.851747	208	9.995452	421	10.004548	10.148253	10.152801	18
43	9.847327	213	9.851622	208	9.995705	421	10.004295	10.148378	10.152673	17
44	9.847454	212	9.851497	209	9.995957	421	10.004043	10.148503	10.152546	16
45	9.847582	212	9.851372	209	9.996210	421	10.003790	10.148628	10.152418	15
46	9.847709	212	9 851246	209	9.996463	421	10.003537	10.148754	10.152291	14
47	9.847836	212	9.851121	209	9.996715	421	10.003285	10.148879	10.152164	13
48	9.847964	212	9.850996	209	9.996968	421	10.003032	10.149004	10.152036	12
49	9.848091	212	9.850870	209	9.997221	421	10.002779	10.149130	10.151909	11
50	9.848218	212	9.850745	209	9.997473	421	10.002527	10.149255	10.151782	10
51	9.848345	212	9.850619	209	9.997726	421	10.002274	10.149381	10.151655	9
52	9.848472	211	9.850493	210	9.997979	421	10.002021	10.149507	10.151528	8
53	9.848599	211	9 850368	210	9.998231	421	10.001769	10.149632	10.151401	7
54	9.848726	211	9.850242	210	9.998484	421	10.001516	10.149758	10.151274	6
55	9.848852	211	9.850116	210	9.998737	421	10.001263	10.149884	10.151148	5
56	9.848979	211	9.849990	210	9.998989	421	10.001011	10.150010	10.151021	4
57	9.849106	211	9.849864	210	9.999242	421	10.000758	10.150136	10.150894	3
58	9.849232	211	9.849738	210	9.999495	421	10.000505	10.150262	10.150768	2
59	9.849359	211	9.849611	210	9.999747	421	10.000253	10.150389	10.150641	1
60	9.849485		9.849485		10.000000		10.000000	10.150515	10.150515	0
M	Co-sine.		Sine.		Co-tang.		Tang.	Co-sec.	Secant.	M

45 Degrees.

TABLE XX.—NATURAL SINES.

M	0°	1°	2°	3°	4°	5°	6°	7°	8°	9°	M
0	000000	017452	034899	052336	069756	087156	104528	121869	139173	156434	60
1	000291	017743	035190	052626	070047	087446	104818	122158	139461	156722	59
2	000582	018034	035481	052917	070337	087735	105107	122447	139749	157009	58
3	000873	018325	035772	053207	070627	088025	105396	122735	140037	157296	57
4	001164	018616	036062	053498	070917	088315	105686	123024	140325	157584	56
5	001454	018907	036353	053788	071207	088605	105975	123313	140613	157871	55
6	001745	019197	036644	054079	071497	088894	106264	123601	140901	158158	54
7	002036	019488	036934	054369	071788	089184	106553	123890	141189	158445	53
8	002327	019779	037225	054660	072078	089474	106843	124179	141477	158732	52
9	002618	020070	037516	054950	072368	089763	107132	124467	141765	159020	51
10	002909	020361	037806	055241	072658	090053	107421	124756	142053	159307	50
11	003200	020652	038097	055531	072948	090343	107710	125045	142341	159594	49
12	003491	020942	038388	055822	073238	090633	107999	125333	142629	159881	48
13	003782	021233	038678	056112	073528	090922	108289	125622	142917	160168	47
14	004072	021524	038969	056402	073818	091212	108578	125910	143205	160455	46
15	004363	021815	039260	056693	074108	091502	108867	126199	143493	160743	45
16	004654	022106	039550	056983	074399	091791	109156	126488	143780	161030	44
17	004945	022397	039841	057274	074689	092081	109445	126776	144068	161317	43
18	005236	022687	040132	057564	074979	092371	109734	127065	144356	161604	42
19	005527	022978	040422	057854	075269	092660	110023	127353	144644	161891	41
20	005818	023269	040713	058145	075559	092950	110313	127642	144932	162178	40
21	006109	023560	041004	058435	075849	093239	110602	127930	145220	162465	39
22	006399	023851	041294	058726	076139	093529	110891	128219	145507	162752	38
23	006690	024141	041585	059016	076429	093819	111180	128507	145795	163039	37
24	006981	024432	041876	059306	076719	094108	111469	128796	146083	163326	36
25	007272	024723	042166	059597	077009	094398	111758	129084	146371	163613	35
26	007563	025014	042457	059887	077299	094687	112047	129373	146659	163900	34
27	007854	025305	042748	060177	077589	094977	112336	129661	146946	164187	33
28	008145	025595	043038	060468	077879	095267	112625	129949	147234	164474	32
29	008436	025886	043329	060758	078169	095556	112914	130238	147522	164761	31
30	008727	026177	043619	061049	078459	095846	113203	130526	147809	165048	30
31	009017	026468	043910	061339	078749	096135	113492	130815	148097	165334	29
32	009308	026759	044201	061629	079039	096425	113781	131103	148385	165621	28
33	009599	027049	044491	061920	079329	096714	114070	131391	148672	165908	27
34	009890	027340	044782	062210	079619	097004	114359	131680	148960	166195	26
35	010181	027631	045072	062500	079909	097293	114648	131968	149248	166482	25
36	010472	027922	045363	062791	080199	097583	114937	132256	149535	166769	24
37	010763	028212	045654	063081	080489	097872	115226	132545	149823	167056	23
38	011054	028503	045944	063371	080779	098162	115515	132833	150111	167342	22
39	011344	028794	046235	063661	081069	098451	115804	133121	150398	167629	21
40	011635	029085	046525	063952	081359	098741	116093	133410	150686	167916	20
41	011926	029375	046816	064212	081649	099030	116382	133698	150973	168203	19
42	012217	929666	047106	064532	081939	099320	116671	133986	151261	168489	18
43	012508	029957	047397	064823	082228	099609	116960	134274	151548	168776	17
44	012799	030248	047688	065113	082518	099899	117249	134561	151836	169063	16
45	013090	030539	047978	065403	082808	100188	117537	134851	152123	169350	15
46	013380	030829	048269	065693	083098	100477	117826	135139	152411	169636	14
47	013671	031120	948559	065984	083388	100767	118115	135427	152698	169923	13
48	013962	031411	048850	066274	083678	101056	118404	135716	152986	170209	12
49	014253	031702	049140	066564	083968	101346	118693	136004	153273	170496	11
50	014544	031992	049431	066854	084258	101635	118982	136292	153561	170783	10
51	014835	032283	049721	067145	084547	101924	119270	136580	153848	171069	9
52	015126	032574	050012	067435	084837	102214	119559	136868	154136	171356	8
53	015416	032864	050302	067725	085127	102503	119848	137156	154423	171643	7
54	015707	033155	050593	068015	085417	102793	120137	137445	154710	171929	6
55	015998	033446	050883	068306	085707	103082	120426	137733	154998	172216	5
56	016289	033737	051174	068596	085997	103371	120714	138021	155285	172502	4
57	016580	034027	051464	068886	086286	103661	121003	138309	155572	172789	3
58	016871	034318	051755	069176	086576	103950	121292	138597	155860	173075	2
59	017162	034609	052045	069466	086866	104239	121581	138885	156147	173362	1
60	017452	034899	052336	069756	087156	104528	121869	139173	156434	173648	0
M	89°	88°.	87°	86°	85°	84°	83°	82°.	81°	80°	M

Natural Co-sines.

Diff. to 100″	485	485	484	484	483	483	482	481	480	478	

TABLE XX.—NATURAL SINES.

M	10°	11°	12°	13°	14°	15°	16°	17°	18°	19°	M
0	173648	190809	207912	224951	241922	258819	275637	292372	309017	325568	60
1	173935	191095	208196	225234	242204	259100	275917	292650	309294	325843	59
2	174221	191380	208481	225518	242486	259381	276197	292928	309570	326118	58
3	174508	191666	208765	225801	242769	259662	276476	293206	309847	326393	57
4	174794	191951	209050	226085	243051	259943	276756	293484	310123	326668	56
5	175080	192237	209334	226368	243333	260224	277035	203762	310400	326943	55
6	175367	192522	209619	226651	243615	260505	277315	294040	310676	327218	54
7	175653	192807	209903	226935	243897	260785	277594	294318	310953	327493	53
8	175939	193093	210187	227218	244179	261066	277874	294596	311229	327768	52
9	176226	193378	210472	227501	244461	261347	279153	294874	311506	328042	51
10	176512	193664	210756	227784	244743	261628	278432	295152	311782	328317	50
11	176798	193949	211040	228068	245025	261908	278712	295430	312059	328592	49
12	177085	194234	211325	228351	245307	262189	278991	295708	312335	328867	48
13	177371	194520	211609	228634	245589	262470	279270	295986	312611	329141	47
14	177657	194805	211893	228917	245871	262751	279550	296264	312888	329416	46
15	177944	195090	212178	229200	246153	263031	279829	296542	313164	329691	45
16	178230	195376	212462	229484	246435	263312	280108	296819	313440	329965	44
17	178516	195661	212746	229767	246717	263592	280388	297097	313716	330240	43
18	178802	195946	213030	230050	246999	263873	280667	297375	313992	330514	42
19	179088	196231	213315	230333	247281	264154	280946	297653	314269	330789	41
20	179375	196517	213599	230616	247563	264434	281225	297930	314545	331063	40
21	179661	196802	213883	230899	247845	264715	281504	298208	314821	331338	39
22	179947	197087	214167	231182	248126	264995	281783	298486	315097	331612	38
23	180233	197372	214451	231465	248408	265276	282062	298763	315373	331887	37
24	180519	197657	214735	231748	248690	265556	282341	299041	315649	332161	36
25	180805	197942	215019	232031	248972	265837	282620	299318	315925	332435	35
26	181091	198228	215303	232314	249253	266117	282900	299596	316201	332710	34
27	181377	198513	215588	232597	249535	266397	283179	299873	316477	332984	33
28	181663	198798	215872	232880	249817	266678	283457	300151	316753	333258	32
29	181950	199083	216156	233163	250098	266958	283736	300428	317029	333533	31
30	182236	199368	216440	233445	250380	267238	284015	300706	317305	333807	30
31	182522	199653	216724	233728	250662	267519	284294	300983	317580	334081	29
32	182808	199938	217008	234011	250943	267799	284573	301261	317856	334355	28
33	183094	200223	217292	234294	251225	268079	284852	301538	318132	334629	27
34	183379	200508	217575	234577	251506	268359	285131	301815	318408	334903	26
35	183665	200793	217859	234859	251788	268640	285410	302093	318684	335178	25
36	183951	201078	218143	235142	252069	268920	285688	302370	318959	335452	24
37	184237	201363	218427	235425	252351	269200	285967	302647	319235	335726	23
38	184523	201648	218711	235708	252632	269480	286246	302924	319511	336000	22
39	184809	201933	218995	235990	252914	269760	286525	303202	319786	336274	21
40	185095	202218	219279	236273	253195	270040	286803	303479	320062	336547	20
41	185381	202502	219562	236556	253477	270320	287082	303756	320337	336821	19
42	185667	202787	219846	236838	253758	270600	287361	304033	320613	337095	18
43	185952	203072	220130	237121	254039	270880	287639	304310	320889	337369	17
44	186238	203357	220414	237403	254321	271160	287918	304587	321164	337643	16
45	186524	203642	220697	237686	254602	271440	288196	304864	321439	337917	15
46	186810	203927	220981	237968	254883	271720	288475	305141	321715	338190	14
47	187096	204211	221265	238251	255165	272000	288753	305418	321990	338464	13
48	187381	204496	221548	238533	255446	272280	289032	305695	322266	338738	12
49	187667	204781	221832	238816	255727	272560	289310	305972	322541	339012	11
50	187953	205065	222116	239098	256008	272840	289589	306249	322816	339285	10
51	188238	205350	222399	239381	256289	273120	289867	306526	323092	339559	9
52	188524	205635	222683	239663	256571	273400	290145	306803	323367	339832	8
53	188810	205920	222967	239946	256852	273679	290424	307080	323642	340106	7
54	189095	206204	223250	240228	257133	273959	290702	307357	323917	340380	6
55	189381	206489	223534	240510	257414	274239	290981	307633	324193	340653	5
56	189667	206773	223817	240793	257695	274519	291259	307910	324468	340927	4
57	189952	207058	224101	241075	257976	274798	291537	308187	324743	341200	3
58	190238	207343	224384	241357	258257	275078	291815	308464	325018	341473	2
59	190523	207627	224668	241640	258538	275351	292094	308740	325293	341747	1
60	190809	207912	224951	241922	258819	275637	292372	309017	325568	342020	0
M	79°	78°	77°	76°	75°	74°	73°	72°	71°	70°	M

Natural Co-sines.

Diff. to 100"	477	475	473	471	469	467	465	462	460	457

TABLE XX.—NATURAL SINES.

M	20°	21°	22°	23°	24°	25°	26°	27°	28°	20°	M
0	342020	358368	374607	390731	406737	422618	438371	453990	469472	484810	60
1	342293	358640	374876	390999	407002	422882	438633	454250	469728	485064	59
2	342567	358911	375146	391267	407268	423145	438894	454509	469985	485318	58
3	342840	359183	375416	391534	407534	423409	439155	454768	470242	485573	57
4	343113	359454	375685	391892	407799	423673	439417	455027	470499	485827	56
5	343387	359725	375955	392070	408065	423936	439678	455286	470755	486081	55
6	343660	359997	376224	392337	408330	424199	439939	455545	471012	486335	54
7	343933	360268	376494	392605	408596	424463	440200	455804	471268	486590	53
8	344206	360540	376763	392872	408861	424726	440462	456063	471525	486844	52
9	344479	360811	377033	393140	409127	424990	440723	456322	471782	487098	51
10	344752	361082	377302	393407	409392	425253	440984	456580	472038	487352	50
11	345025	361353	377571	393675	409658	425516	441245	456839	472294	487606	49
12	345298	361625	377841	393942	409923	425779	441506	457098	472551	487860	48
13	345571	361896	378110	394209	410188	426042	441767	457357	472807	488114	47
14	345844	362167	378379	394477	410454	426306	442028	457615	473063	488367	46
15	346117	362438	378649	394744	410719	426569	442289	457874	473320	488621	45
16	346390	362709	378918	395011	410984	426832	442550	458133	473576	488875	44
17	346663	362980	379187	395278	411249	427095	442810	458391	473832	489129	43
18	346936	363251	379456	395546	411514	427358	443071	458650	474088	489382	42
19	347208	363522	379725	395813	411779	427621	443332	458908	474344	489636	41
20	347481	363793	379994	396080	412045	427884	443593	459166	474600	489890	40
21	347754	364064	380263	396347	412310	428147	443853	459425	474856	490143	39
22	348927	364335	380532	396614	412575	428410	444114	459683	475112	490397	38
23	348299	364606	380801	396881	412840	428672	444375	459942	475368	490650	37
24	348572	364877	381070	397148	413104	428935	444635	460200	475624	490904	36
25	348845	365148	381339	397415	413369	429198	444896	460458	475880	491157	35
26	349117	365418	381608	397682	413634	429461	445156	460716	476136	491411	34
27	349390	365689	381877	397949	413899	429723	445417	460974	476392	491664	33
28	349662	365960	382146	398215	414164	429986	445677	461232	476647	491917	32
29	349935	366231	382415	398482	414429	430249	445937	461491	476903	492170	31
30	350207	366501	382683	398749	414693	430511	446198	461749	477159	492424	30
31	350480	366772	382952	399016	414958	430774	446458	462007	477414	492677	29
32	350752	367042	383221	399283	415223	431036	446718	462265	477670	492930	28
33	351025	367313	383490	399549	415487	431299	446979	462523	477925	493183	27
34	351297	367584	383758	399816	415752	431561	447239	462780	478181	493436	26
35	351569	367854	384027	400082	416016	431823	447499	463038	478436	493689	25
36	351842	368125	384295	400349	416281	432086	447759	463296	478692	493942	24
37	352114	368395	384564	400616	416545	432348	448019	463554	478947	494195	23
38	352386	368665	384832	400882	416810	432610	448279	463812	479203	494448	22
39	352658	368936	385101	401149	417074	432873	448539	464069	479458	494700	21
40	352931	369206	385369	401415	417338	433135	448799	464327	479713	494953	20
41	353203	369476	385638	401681	417603	433397	449059	464584	479968	495206	19
42	353475	369747	385906	401948	417867	433659	449319	464842	480223	495459	18
43	353747	370017	386174	402214	418131	433921	449579	465100	480479	495711	17
44	354019	370287	386443	402480	418396	434183	449839	465357	480734	495964	16
45	354291	370557	386711	402747	418660	434445	450098	465615	480989	496217	15
46	354563	370828	386979	403013	418924	434707	450358	465872	481244	496469	14
47	354835	371098	387247	403279	419188	434969	450618	466129	481499	496722	13
48	355107	371368	387516	403545	419452	435231	450878	466387	481754	496974	12
49	355379	371638	387784	403811	419716	435493	451137	466644	482009	497226	11
50	355651	371908	388052	404078	419980	435755	451397	466901	482263	497479	10
51	355923	372178	388320	404344	420244	436017	451656	467158	482518	497731	9
52	356194	372448	388588	404610	420508	436278	451916	467416	482773	497983	8
53	356466	372718	388856	404876	420772	436540	452175	467673	483028	498236	7
54	356738	372988	389124	405142	421036	436802	452435	467930	483282	498488	6
55	357010	373258	389392	405408	421300	437063	452694	468187	483537	498740	5
56	357281	373528	389660	405673	421563	437325	452953	468444	483792	498992	4
57	357553	373797	389928	405939	421827	437587	453213	468701	484046	499244	3
58	357825	374067	390196	406205	422091	437848	453472	468958	484301	499496	2
59	358069	374337	390463	406471	422355	438110	453731	469215	484555	499748	1
60	358368	374607	390731	406737	422618	438371	453990	469472	484810	500000	0
M	69°	68°	67°	66°	65°	64°	63°	62°	61°	60°	M

Natural Co-sines.

Diff. to 100″	454	451	448	445	441	438	434	430	426	422	

TABLE XX.—NATURAL SINES.

M	30°	31°	32°	33°	34°	35°	36°	37°	38°	39°	M
0	500000	515038	529919	544639	559193	573576	587785	601815	615661	629320	6
1	500252	515287	530166	544883	559434	573815	588021	602047	615891	629546	5
2	500504	515537	530413	545127	559675	574053	588256	602280	616120	629772	5
3	500756	515786	530659	545371	559916	574291	588491	602512	616349	629998	5
4	501007	516035	530906	545615	560157	574529	588726	602744	616578	630224	5
5	501259	516284	531152	545858	560398	574767	588961	602976	616807	630450	5
6	501511	516533	531399	546102	560639	575005	589196	603208	617036	630676	5
7	501762	516782	531645	546346	560880	575243	589431	603440	617265	630902	5
8	502014	517031	531891	546589	561121	575481	589666	603672	617494	631127	5
9	502266	517280	532138	546833	561361	575719	589901	603904	617722	631353	5
10	502517	517529	532384	547076	561602	575957	590136	604136	617951	631578	5
11	502769	517778	532630	547320	561843	576195	590371	604367	618180	631804	4
12	503020	518027	532876	547563	562083	576432	590606	604599	618408	632029	4
13	503271	518276	533122	547807	562324	576670	590840	604831	618637	632255	4
14	503523	518525	533368	548050	562564	576908	591075	605062	618865	632480	4
15	503774	518773	533615	548293	562805	577145	591310	605294	619094	632705	4
16	504025	519022	533861	548536	563045	577383	591544	605526	619322	632931	4
17	504276	519271	534106	548780	563286	577620	591779	605757	619551	633156	4
18	504528	519519	534352	549023	563526	577858	592013	605988	619779	633381	4
19	504779	519768	534598	549266	563766	578095	592248	606220	620007	633606	4
20	505030	520016	534844	549509	564007	578332	592482	606451	620235	633831	4
21	505281	520265	535090	549752	564247	578570	592716	606682	620464	634056	39
22	505532	520513	535335	549995	564487	578807	592951	606914	620692	634281	38
23	505783	520761	535581	550238	564727	579044	593185	607145	620920	634506	37
24	506034	521010	535827	550481	564967	579281	593419	607376	621148	634731	36
25	506285	521258	536072	550724	565207	579518	593653	607607	621376	634955	35
26	506535	521506	536318	550966	565447	579755	593887	607838	621604	635180	34
27	506786	521754	536563	551209	565687	579992	594121	608069	621831	635405	33
28	507037	522002	536809	551452	565927	580229	594355	608300	622059	635629	32
29	507288	522251	537054	551694	566166	580466	594589	608531	622287	635854	31
30	507538	522499	537300	551937	566406	580703	594823	608761	622515	636078	30
31	507789	522747	537545	552180	566646	580940	595057	608992	622742	636303	29
32	508040	522995	537790	552422	566886	581176	595290	609223	622970	636527	28
33	508290	523242	538035	552664	567125	581413	595524	609454	623197	636751	27
34	508541	523490	538281	552907	567365	581650	595758	609684	623425	636976	26
35	508791	523738	538526	553149	567604	581886	595991	609915	623652	637200	25
36	509041	523986	538771	553392	567844	582123	596225	610145	623880	637424	24
37	509292	524234	539016	553634	568083	582359	596458	610376	624107	637648	23
38	509542	524481	539261	553876	568323	582596	596692	610606	624334	637872	22
39	509792	524729	539506	554118	568562	582832	596925	610836	624561	638096	21
40	510043	524977	539751	554360	568801	583069	597159	611067	624789	638320	20
41	510293	525224	539996	554602	569040	583305	597392	611297	625016	638544	19
42	510543	525472	540240	554844	569280	583541	597625	611527	625243	638768	18
43	510793	525719	540485	555086	569519	583777	597858	611757	625470	638992	17
44	511043	525967	540730	555328	569758	584014	598092	611987	625697	639215	16
45	511293	526214	540974	555570	569997	584250	598325	612217	625923	639439	15
46	511543	526461	541219	555812	570236	584486	598558	612447	626150	639663	14
47	511793	526709	541464	556054	570475	584722	598791	612677	626377	639886	13
48	512043	526956	541708	556290	570714	584958	599024	612907	626604	640110	12
49	512293	527203	541953	556537	570952	585194	599256	613137	626830	640333	11
50	512543	527450	542197	556779	571191	585429	599489	613367	627057	640557	10
51	512792	527697	542442	557021	571430	585665	599722	613596	627284	640780	9
52	513042	527944	542686	557262	571669	585901	599955	613826	627510	641003	8
53	513292	528191	542930	557504	571907	586137	600188	614056	627737	641226	7
54	513541	528438	543174	557745	572146	586372	600420	614285	627963	641450	6
55	513791	528685	543419	557987	572384	586608	600653	614515	628189	641673	5
56	514040	528932	513663	558228	572623	586844	600885	614744	628416	641896	4
57	514290	529179	543907	558469	572861	587079	601118	614974	628642	642119	3
58	514539	529426	544151	558710	573100	587314	601350	615203	628868	642342	2
59	514789	529673	544395	558952	573338	587550	601583	615432	629094	642565	1
60	515038	529919	544639	559193	573576	587785	601815	615661	629320	642788	0
M	59°	58°	57°	56°	55°	54°	53°	52°	51°	50°	M

Natural Co-sines.

Diff. to 100″.	418	413	409	404	399	394	390	385	380	374

TABLE XX.—NATURAL SINES.

M	40°	41°	42°	43°	44°	45°	46°	47°	48°	49°	M
0	642788	656059	669131	681998	694658	707107	719340	731354	743145	754710	60
1	643010	656279	669347	682211	694868	707312	717542	731552	743339	754900	59
2	643233	656498	669563	682424	695077	707518	719744	731750	743534	755091	58
3	643456	656717	669779	682636	695286	707723	719946	731949	743728	755282	57
4	643679	656937	669995	682849	695495	707929	720148	732147	743923	755472	56
5	643901	657156	670211	683061	695704	708134	720349	732345	744117	755663	55
6	644124	657375	670427	683274	695913	708340	720551	732543	744312	755853	54
7	644346	657594	670642	683486	696122	708545	720753	732741	744506	756044	53
8	644569	657814	670858	683698	696330	708750	720954	732939	744700	756234	52
9	644791	658033	671074	683911	696539	708956	721156	733137	744894	756425	51
10	645013	658252	671289	684123	696748	709161	721357	733334	745088	756615	50
11	645236	658471	671505	684335	696957	709366	721559	733532	745282	756805	49
12	645458	658689	671721	684547	697165	709571	721760	733730	745476	756995	48
13	645980	658908	671936	684759	697374	709776	721962	733927	745670	757185	47
14	645902	659127	672151	684971	697582	709981	722163	734125	745864	757375	46
15	646124	659346	672367	685183	697790	710185	722364	734323	746057	757565	45
16	646346	659565	672582	685395	697999	710390	722565	734520	746251	757755	44
17	646568	659783	672797	685607	698207	710595	722766	734717	746445	757945	43
18	646790	660002	673013	685818	698415	710799	722967	734915	746638	758134	42
19	647012	660220	673228	686030	698623	711004	723168	735112	746832	758324	41
20	647233	660439	673443	686242	698832	711209	723369	735309	747025	758514	40
21	647455	660657	673658	686453	699040	711413	723570	735506	747218	758703	39
22	647677	660875	673873	686665	699248	711617	723771	735703	747412	758893	38
23	647898	661094	674088	686876	699455	711822	723971	735900	747605	759082	37
24	648120	661312	674302	687088	699663	712026	724172	736097	747798	759271	36
25	648341	661530	674517	687299	699871	712230	724372	736294	747991	759461	35
26	648563	661748	674732	687510	700079	712434	724573	736491	748184	759650	34
27	648784	661966	674947	687721	700287	712639	724773	736687	748377	759839	33
28	649006	662184	675161	687932	700494	712843	724974	736884	748570	760028	32
29	649227	662402	675376	688144	700702	713047	725174	737081	748763	760217	31
30	649448	662620	675590	688355	700909	713250	725374	737277	748956	760406	30
31	649669	662838	675805	688566	701117	713454	725575	737474	749148	760595	29
32	649890	663056	676019	688776	701324	713658	725775	737670	749341	760784	28
33	650111	663273	676233	688987	701531	713862	725975	737867	749534	760972	27
34	650332	663491	676448	689198	701739	714066	726175	738063	749726	761161	26
35	650553	663709	676662	689409	701946	714269	726375	738259	749919	761350	25
36	650774	663926	676876	689620	702153	714473	726575	738455	750111	761538	24
37	650995	664144	677090	689830	702360	714676	726775	738651	750303	761727	23
38	651216	664361	677304	690041	702567	714880	726974	738848	750496	761915	22
39	651437	664579	677518	690251	702774	715083	727174	739043	750688	762104	21
40	651657	664796	677732	690462	702981	715286	727374	739239	750880	762292	20
41	651878	665013	677946	690672	703188	715490	727573	739435	751072	762480	19
42	652098	665230	678160	690882	703395	715693	727773	739631	751264	762668	18
43	652319	665448	678373	691093	703601	715896	727972	739827	751456	762856	17
44	652539	665665	678587	691303	703808	716099	728172	740023	751648	763044	16
45	652760	665882	678801	691513	704015	716302	728371	740218	751840	763232	15
46	652980	666099	679014	691723	704221	716505	728570	740414	752032	763420	14
47	653200	666316	679228	691933	704428	716708	728769	740609	752223	763608	13
48	653421	666532	679441	692142	704634	716911	728969	740805	752415	763796	12
49	653641	666749	679655	692353	704841	717113	729168	741000	752606	763984	11
50	653861	666966	679868	692563	705047	717316	729367	741195	752798	764171	10
51	654081	667183	680081	692773	705253	717519	729566	741391	752989	764359	9
52	654301	667399	680295	692983	705459	717721	729765	741586	753181	764547	8
53	654521	667616	680508	693192	705665	717924	729963	741781	753372	764734	7
54	654741	667833	680721	693402	705872	718126	730162	741976	753563	764921	6
55	654961	668049	680934	693611	706078	718329	730361	742171	753755	765109	5
56	655180	668265	681147	693821	706284	718531	730560	742366	753946	765296	4
57	655400	668482	681360	694030	706489	718733	730758	742561	754137	765483	3
58	655620	668698	681573	694240	706695	718936	730957	742755	754328	765670	2
59	655839	668914	681786	694449	706901	719138	731155	742950	754519	765857	1
60	656059	669131	681998	694658	707107	719340	731354	743145	754710	766044	0
M	49°	48°	47°	46°	45°	44°	43°	42°	41°	40°	M

Natural Co-sines.

Diff. to 100″	369	363	357	352	346	340	334	327	321	315	

TABLE XX.—NATURAL SINES.

M	50°	51°	52°	53°	54°	55°	56°	57°	58°	59°
0	766044	777146	788011	798636	809017	819152	829038	838671	848048	85716
1	766231	777329	788190	798811	809188	819319	829200	838829	848202	85731
2	766418	777512	788369	798985	809359	819486	829363	838987	848356	85746
3	766605	777695	788548	799160	809530	819652	829525	839146	848510	85761
4	766792	777878	788727	799335	809700	819819	829688	839304	848664	85776
5	766979	778060	788905	799510	809871	819985	829850	839462	848818	85791
6	767165	778243	789084	799685	810042	820152	830012	839620	848972	85806
7	767352	778426	789263	799859	810212	820318	830174	839778	849125	85821
8	767538	778608	789441	800034	810383	820485	830337	839936	849279	85836
9	767725	778791	789620	800208	810553	820651	830499	840094	849433	85851
10	767911	778973	789798	800383	810723	820817	830661	840251	849586	85866
11	768097	779156	789977	800557	810894	820983	830823	840409	849739	85881
12	768284	779338	790155	800731	811064	821149	830984	840567	849893	85896
13	768470	779520	790333	800906	811234	821315	831146	840724	850046	85910
14	768656	779702	790511	801080	811404	821481	831308	840882	850199	85925
15	768842	779884	790690	801254	811574	821647	831470	841039	850352	85940
16	769028	780067	790868	801428	811744	821815	831631	841196	850505	85955
17	769214	780249	791046	801602	811914	821978	831793	841354	850658	85970
18	769400	780430	791224	801776	812084	822144	831954	841511	850811	85985
19	769585	780612	791401	801949	812253	822310	832115	841668	850964	86000
20	769771	780794	791579	802123	812423	822475	832277	841825	851117	86014
21	769957	780976	791757	802297	812592	822641	832438	841982	851269	86029
22	770142	781157	791935	802470	812762	822806	832599	842139	851422	86044
23	770328	781339	792112	802644	812931	822971	832760	842296	851575	86059
24	770513	781520	792290	802817	813101	823136	832921	842452	851727	86074
25	770699	781702	792467	802991	813270	823302	833082	842609	851879	86089
26	770884	781883	792644	803164	813439	823467	833243	842766	852032	86103
27	771069	782065	792822	803337	813608	823632	833404	842922	852184	86118
28	771254	782246	792999	803511	813778	823797	833565	843079	852336	86133
29	771440	782427	793176	803684	813947	823961	833725	843235	852488	86148
30	771625	782608	793353	803857	814116	824126	833886	843391	852640	86162
31	771810	782789	793530	804030	814284	824291	834046	843548	852792	86177
32	771995	782970	793707	804203	814453	824456	834207	843704	852944	86192
33	772179	783151	793884	804376	814622	824620	834367	843860	853096	86207
34	772364	783332	794061	804548	814791	824785	834527	844016	853248	86221
35	772549	783513	794238	804721	814959	824949	834688	844172	853399	86236
36	772734	783693	794415	804894	815128	825113	834848	844328	853551	86251
37	772918	783874	794591	805066	815296	825278	835008	844484	853702	86266
38	773103	784055	794768	805239	815465	825442	835168	844640	853854	86280
39	773287	784235	794944	805411	815633	825606	835328	844795	854005	86295
40	773472	784416	795121	805584	815801	825770	835488	844951	854156	86310
41	773656	784596	795297	805756	815969	825934	835648	845106	854308	86324
42	773840	784776	795473	805928	816138	826098	835807	845262	854459	86339
43	774024	784957	795650	806100	816306	826262	835967	845417	854610	86354
44	774209	785137	795826	806273	816474	826426	836127	845573	854761	86368
45	774393	785317	796002	806445	816642	826590	836286	845728	854912	86383
46	774577	785497	796178	806617	816809	826753	836446	845883	855063	863982
47	774761	785677	796354	806788	816977	826917	836605	846038	855214	864128
48	774944	785857	796530	806960	817145	827081	836764	846193	855364	864275
49	775128	786037	796706	807132	817313	827244	836924	846348	855515	864421
50	775312	786217	796882	807304	817480	827407	837083	846503	855665	864567
51	775496	786396	797057	807475	817648	827571	837242	846658	855816	864713
52	775679	786576	797233	807647	817815	827734	837401	846813	855966	864860
53	775863	786756	797408	807818	817982	827897	837560	846967	856117	865006
54	776046	786935	797584	807990	818150	828060	837719	847122	856267	865151
55	776230	787114	797759	808161	818317	828223	837878	847277	856417	865297
56	776413	787294	797935	808333	818484	828386	838036	847431	856567	865443
57	776596	787473	798110	808504	818651	828549	838195	847585	856718	865589
58	776780	787652	798285	808675	818818	828712	838354	847740	856868	865734
59	776963	787832	798460	808846	818985	828875	838512	847894	857017	865880
60	777146	788011	798636	809017	819152	829038	838671	848048	857167	866025
M	39°	38°	37°	36°	35°	34°	33°	32°	31°	30°

Natural Co-sines.

Diff. to 100"	309	302	295	288	282	275	268	260	253	246

TABLE XX.—NATURAL SINES.

M	60°	61°	62°	63°	64°	65°	66°	67°	68°	69°	M
0	866025	874620	882948	891007	898794	906308	913545	920505	927184	933580	60
1	866171	874761	883084	891139	898922	906431	913664	920618	927293	933685	59
2	866316	874902	883221	891270	899049	906554	913782	920732	927402	933789	58
3	866461	875042	883357	891402	899176	906676	913900	920846	927510	933893	57
4	866607	875183	883493	891534	899304	906799	914018	920959	927619	933997	56
5	866752	875324	883629	891666	899431	906922	914136	921072	927728	934101	55
6	866897	875465	883766	891798	899558	907044	914254	921185	927836	934204	54
7	867042	875605	883902	891929	899685	907166	914372	921299	927945	934308	53
8	867187	875746	884038	892061	899812	907289	914490	921412	928053	934412	52
9	867331	875886	884174	892192	899939	907411	914607	921525	928161	934515	51
10	867476	876026	884309	892323	900065	907533	914725	921638	928270	934619	50
11	867621	876167	884445	892455	900192	907655	914842	921750	928378	934722	49
12	867765	876307	884581	892586	900319	907777	914960	921863	928486	934826	48
13	867910	876447	884717	892717	900445	907899	915077	921976	928594	934929	47
14	868054	876587	884852	892848	900572	908021	915194	922088	928702	935032	46
15	868199	876727	884988	892979	900698	908143	915311	922201	928810	935135	45
16	868343	876867	885123	893110	900825	908265	915429	922313	928917	935238	44
17	868487	877006	885258	893241	900951	908387	915546	922426	929025	935341	43
18	868632	877146	885394	893371	901077	908508	915663	922538	929133	935444	42
19	868776	877286	885529	893502	901203	908630	915779	922650	929240	935547	41
20	868920	877425	885664	893633	901329	908751	915896	922762	929348	935650	40
21	869064	877565	885799	893763	901455	908872	916013	922874	929455	935752	39
22	869207	877704	885934	893894	901581	908994	916130	922986	929562	935855	38
23	869351	877844	886069	894024	901707	909115	916246	923098	929669	935957	37
24	869495	877983	886204	894154	901833	909236	916363	923210	929776	936060	36
25	869639	878122	886338	894284	901958	909357	916479	923322	929884	936162	35
26	869782	878261	886473	894415	902084	909478	916595	923434	929990	936264	34
27	869926	878400	886608	894545	902209	909599	916712	923545	930097	936366	33
28	870069	878539	886742	894675	902335	909720	916828	923657	930204	936468	32
29	870212	878678	886876	894805	902460	909841	916944	923768	930311	936570	31
30	870356	878817	887011	894934	902585	909961	917060	923880	930418	936672	30
31	870499	878956	887145	895064	902710	910082	917176	923991	930524	936774	29
32	870642	879095	887279	895194	902836	910202	917292	924102	930631	936876	28
33	870785	879233	887413	895323	902961	910323	917408	924213	930737	936977	27
34	870928	879372	887548	895453	903086	910443	917523	924324	930843	937079	26
35	871071	879510	887681	895582	903210	910563	917639	924435	930950	937181	25
36	871214	879649	887815	895712	903335	910684	917755	924546	931056	937282	24
37	871357	879787	887949	895841	903460	910804	917870	924657	931162	937383	23
38	871499	879925	888083	895970	903585	910924	917986	924768	931268	937485	22
39	871642	880063	888217	896099	903709	911044	918101	924878	931374	937586	21
40	871784	880201	888350	896229	903834	911164	918216	924989	931480	937687	20
41	871927	880339	888484	896358	903958	911284	918331	925099	931586	937788	19
42	872069	880477	888617	896486	904083	911403	918446	925210	931691	937889	18
43	872212	880615	888751	896615	904207	911523	918561	925320	931797	937990	17
44	872354	880753	888884	896744	904331	911643	918676	925430	931902	938091	16
45	872496	880891	889017	896873	904455	911762	918791	925541	932008	938191	15
46	872638	881028	889150	897001	904579	911881	918906	925651	932113	938292	14
47	872780	881166	889283	897130	904703	912001	919021	925761	932219	938393	13
48	872922	881303	889416	897258	904827	912120	919135	925871	932324	938493	12
49	873064	881441	889549	897385	904951	912239	919250	925980	932429	938593	11
50	873206	881578	889682	897515	905075	912358	919364	926090	932534	938694	10
51	873347	881716	889815	897643	905198	912477	919479	926200	932639	938794	9
52	873489	881853	889948	897771	905322	912596	919593	926310	932744	938894	8
53	873631	881990	890080	897900	905445	912715	919707	926419	932849	938994	7
54	873772	882127	890213	898028	905569	912834	919821	926529	932954	939094	6
55	873914	882264	890345	898156	905692	912953	919936	926638	933058	939194	5
56	874055	882401	890478	898283	905815	913072	920050	926747	933163	939294	4
57	874196	882538	890610	898411	905939	913190	920164	926857	933267	939394	3
58	874338	882674	890742	898539	906062	913309	920277	926966	933372	939493	2
59	874479	882811	890874	898666	906185	913427	920391	927075	933476	939593	1
60	874620	882948	891007	898794	906308	913545	920505	927184	933580	939693	0
M	29°	28°	27°	26°	25°	24°	23°	22°	21°	20°	M

Natural Co-sines.

Diff. to 100″	239	231	224	216	209	201	193	185	178	170	T

TABLE XX.—NATURAL SINES.

M	70°	71°	72°	73°	74°	75°	76°	77°	78°	79°	M
0	939693	945519	951057	956405	961262	965926	970296	974370	978148	981627	60
1	939792	945613	951146	956390	961342	966001	970366	974435	978208	981683	59
2	939891	945708	951236	956475	961422	966076	970436	974501	978268	981738	58
3	939991	945802	951326	956560	961502	966151	970506	974566	978329	981793	57
4	940090	945897	951415	956644	961582	966226	970577	974631	978389	981849	56
5	940189	945991	951505	956729	961662	966301	970647	974696	978449	981904	55
6	940288	946085	951594	956814	961741	966376	970716	974761	978509	981959	54
7	940387	946180	951684	956898	961821	966451	970786	974826	978569	982014	53
8	940486	946274	951773	956983	961901	966526	970856	974891	978629	982069	52
9	940585	946368	951862	957067	961980	966600	970926	974956	978689	982123	51
10	940684	946462	951951	957151	962059	966675	970995	975020	978748	982178	50
11	940782	946555	952040	957235	962139	966749	971065	975085	978808	982233	49
12	940881	946649	952129	957319	962218	966823	971134	975149	978867	982287	48
13	940979	946743	952218	957404	962297	966898	971204	975214	978927	982342	47
14	941078	946837	952307	957487	962376	966972	971273	975278	978986	982396	46
15	941176	946930	952396	957571	962455	967046	971342	975342	979045	982450	45
16	941274	947024	952484	957655	962534	967120	971411	975406	979105	982505	44
17	941372	947117	952573	957739	962613	967194	971480	975471	979164	982559	43
18	941471	947210	952661	957822	962692	967268	971549	975535	979223	982613	42
19	941569	947304	952750	957906	962770	967342	971618	975598	979282	982667	41
20	941666	947397	952838	957990	962849	967415	971687	975662	979341	982721	40
21	941764	947490	952926	958073	962928	967489	971755	975726	979399	982774	39
22	941862	947583	953015	958156	963006	967562	971824	975790	979458	982828	38
23	941960	947676	953103	958239	963084	967636	971893	975853	979517	982882	37
24	942057	947768	953191	958323	963163	967709	971961	975917	979575	982935	36
25	942155	947861	953279	958406	963241	967782	972030	975980	979634	982989	35
26	942252	947954	953366	958489	963319	967856	972098	976044	979692	983042	34
27	942350	948046	953454	958572	963397	967929	972166	976107	979750	983096	33
28	942447	948139	953542	958654	963475	968002	972234	976170	979809	983149	32
29	942544	948231	953629	958737	963553	968075	972302	976233	979867	983202	31
30	942641	948324	953717	958820	963630	968148	972370	976296	979925	983255	30
31	942739	948416	953804	958902	963708	968220	972438	976359	979983	983308	29
32	942836	948508	953892	958985	963786	968293	972506	976422	980041	983361	28
33	942932	948600	953979	959067	963863	968366	972573	976485	980098	983414	27
34	943029	948692	954066	959150	963941	968438	972641	976547	980156	983466	26
35	943126	948784	954153	959232	964018	968511	972708	976610	980214	983519	25
36	943223	948876	954240	959314	964095	968583	972776	976672	980271	983571	24
37	943319	948968	954327	959396	964173	968656	972843	976735	980329	983624	23
38	943416	949059	954414	959478	964250	968728	972911	976797	980386	983676	22
39	943512	949151	954501	959560	964327	968800	972978	976859	980443	983729	21
40	943609	949243	954588	959642	964404	968872	973045	976921	980500	983781	20
41	943705	949334	954674	959724	964481	968944	973112	976984	980558	983833	19
42	943801	949425	954761	959805	964557	969016	973179	977046	980615	983885	18
43	943897	949517	954847	959887	964634	969088	973246	977108	980672	983937	17
44	943993	949608	954934	959968	964711	969159	973313	977169	980728	983989	16
45	944089	949699	955020	960050	964787	969231	973379	977231	980785	984041	15
46	944185	949790	955106	960131	964864	969302	973446	977293	980842	984092	14
47	944281	949881	955192	960212	964940	969374	973512	977354	980899	984144	13
48	944376	949972	955278	960294	965016	969445	973579	977416	980955	984196	12
49	944472	950063	955364	960375	965093	969517	973645	977477	981012	984247	11
50	944568	950154	955450	960456	965169	969588	973712	977539	981068	984298	10
51	944663	950244	955536	960537	965245	969659	973778	977600	981124	984350	9
52	944758	950335	955622	960618	965321	969730	973844	977661	981181	984401	8
53	944854	950425	955707	960698	965397	969801	973910	977722	981237	984452	7
54	944949	950516	955793	960779	965473	969872	973976	977783	981293	984503	6
55	945044	950606	955879	960860	965548	969943	974042	977844	981349	984554	5
56	945139	950696	955964	960940	965624	970014	974108	977905	981405	984605	4
57	945234	950786	956049	961021	965700	970084	974173	977966	981460	984656	3
58	945329	950877	956134	961101	965775	970155	974239	978026	981516	984707	2
59	945424	950967	956220	961181	965850	970225	974305	978087	981572	984757	1
60	945519	951057	956305	961262	965926	970296	974370	978148	981627	984808	0
M	19°	18°	17°	16°	15°	14°	13°	12°	11°	10°	M

Natural Co-sines.

Diff. to 100″	162	154	146	138	130	121	113	105	97	88

TABLE XX.—NATURAL SINES.

M	80°	81°	82°	83°	84°	85°	86°	87°	88°	89°	M
0	984808	987688	990268	992546	994522	996195	997564	998630	999391	999848	60
1	984858	987734	990309	992582	994552	996220	997584	998645	999401	999853	59
2	984909	987779	990349	992617	994583	996245	997604	998660	999411	999858	58
3	984959	987824	990389	992652	994613	996270	997625	998675	999421	999863	57
4	985009	987870	990429	992687	994643	996295	997645	998690	999431	999867	56
5	985059	987915	990469	992722	994673	996320	997664	998705	999441	999872	55
6	985109	987960	990509	992757	994703	996345	997684	998719	999450	999877	54
7	985159	988005	990549	992792	994733	996370	997704	998734	999460	999881	53
8	985209	988050	990589	992827	994762	996395	997724	998749	999469	999886	52
9	985259	988094	990629	992862	994792	996419	997743	998763	999479	999890	51
10	985309	988139	990669	992896	994822	996444	997763	998778	999488	999894	50
11	985358	988184	990708	992931	994851	996468	997782	998792	999497	999898	49
12	985408	988228	990748	992966	994881	996493	997801	998806	999507	999903	48
13	985457	988273	990787	993000	994910	996517	997821	998820	999516	999907	47
14	985507	988317	990827	993034	994939	996541	997840	998834	999525	999910	46
15	985556	988362	990866	993068	994969	996566	997859	998848	999534	999914	45
16	985605	988406	990905	993103	994998	996589	997878	998862	999542	999918	44
17	985654	988450	990944	993137	995027	996614	997897	998876	999551	999922	43
18	985703	988494	990983	993171	995056	996637	997916	998890	999560	999925	42
19	985752	988538	991022	993205	995084	996661	997934	998904	999568	999929	41
20	985801	988582	991061	993238	995113	996685	997953	998917	999577	999932	40
21	985850	988626	991100	993272	995142	996709	997972	998931	999585	999936	39
22	985899	988669	991138	993300	995170	996732	997990	998944	999594	999939	38
23	985947	988713	991177	993339	995199	996756	998008	998957	999602	999942	37
24	985996	988756	991216	993373	995227	996779	998027	998971	999610	999945	36
25	986045	988800	991254	993406	995256	996802	998045	998984	999618	999948	35
26	986093	988843	991292	993439	995284	996825	998063	998997	999626	999951	34
27	986141	988886	991331	993473	995312	996848	998081	999010	999634	999954	33
28	986189	988930	991369	993506	995340	996872	998009	999023	999642	999957	32
29	986238	988973	991407	993539	995368	996894	998117	999035	999650	999959	31
30	986286	989016	991445	993572	995396	996917	998135	999048	999657	999962	30
31	986334	989059	991483	993605	995424	996940	998153	999061	999665	999964	29
32	986381	989102	991521	993638	995452	996963	998170	999073	999672	999967	28
33	986429	989145	991558	993670	995479	996985	998188	999086	999680	999969	27
34	986477	989187	991596	993703	995507	997008	998205	999098	999687	999971	26
35	986525	989230	991634	993735	995535	997030	998223	999111	999694	999974	25
36	986572	989272	991671	993768	995562	997053	998240	999123	999701	999976	24
37	986620	989315	991709	993800	995589	997075	998257	999135	999709	999978	23
38	986667	989357	991746	993833	995617	997097	998274	999147	999716	999980	22
39	986714	989399	991783	993865	995644	997119	998291	999159	999722	999981	21
40	986762	989442	991820	993897	995671	997141	998308	999171	999729	999983	20
41	986809	989484	991857	993929	995698	997163	998325	999183	999736	999985	19
42	986856	989526	991894	993961	995725	997185	998342	999194	999743	999986	18
43	986903	989568	991931	993993	995752	997207	998359	999206	999749	999988	17
44	986950	989610	991968	994025	005778	997229	998375	999218	999756	999989	16
45	986996	989651	992005	994056	995805	997250	998392	999229	999762	999990	15
46	987043	989693	992042	994088	995832	997272	998408	999240	999768	999992	14
47	987090	989735	992078	994120	995858	997293	998425	999252	999775	999993	13
48	987136	989776	992115	994151	995884	997314	998441	999263	999781	999994	12
49	987183	989818	992151	994182	995911	997336	998457	999274	999787	999995	11
50	987229	989859	992187	994214	995937	997357	998473	999285	999793	999996	10
51	987275	989900	992224	994245	995963	997378	998489	999296	999799	999997	9
52	987322	989942	992260	994276	995989	997399	998505	999307	999804	999997	8
53	987368	989983	992296	994307	996015	997420	998521	999318	999810	999998	7
54	987414	990024	992332	994338	996041	997441	998537	999328	999816	999998	6
55	987460	990065	992368	994369	996067	997462	998552	999339	999821	999999	5
56	987506	990105	992404	994400	996093	997482	998568	999350	999827	999999	4
57	987551	990146	992439	994430	996118	997503	998583	999360	999832	1000000	3
58	987597	990187	992475	994461	996144	997523	998599	999370	999837	1000000	2
59	987643	990228	992511	994491	996169	997544	998614	999381	999843	1000000	1
60	987688	990268	992546	994522	996195	997564	998630	999391	999848	1000000	0
M	9°	8°	7°	6°	5°	4°	3°	2°	1°	0°	M

Natural Co-sines.

Diff. to 100″	80	72	63	55	47	38	30	21	13	4

TABLE XXI.

LOG RISING, OR VERSED SINES.

RISING.

0 Hour.

M	0s	5s	10s	15s	20s	25s	30s	35s	40s	45s	50s	55s	Pro. pts.	
0	9.				02436	21818	37654	51044	62642	72873	82024	90303		
1	9.97860	04813	11250	17242	22848	28114	33079	37775	42230	46468	50509	54370		
2	0.58066	61612	65019	68297	71455	74503	77448	80296	83054	85726	88319	90837		
3	93284	95664	97980	00236	02435	04580	06673	08717	10714	12666	14575	16443		
4	1.18271	20062	21817	23537	25224	26878	28502	30095	31660	33198	34708	36193		
5	37653	39088	40501	41890	43258	44605	45931	47237	48524	49792	51041	52273		
6	53488	54686	55868	57034	58184	59320	60440	61547	62639	63718	64784	65837		
7	66877	67905	68920	69924	70917	71898	72869	73829	74778	75717	76646	77565		
8	78474	79374	80265	81147	82019	82884	83739	84587	85426	86257	87080	87896		
9	88703	89504	90297	91083	91862	92634	93399	94157	94909	95655	96394	97127		
10	1.97854	98574	99289	99998	00701	01399	02091	02777	03458	04134	04805	05470	s	603
11	2.06131	06786	07437	08082	08723	09359	09991	10618	11240	11859	12472	13082	1	120
12	13687	14288	14885	15477	16066	16651	17232	17809	18382	18951	19517	20079	2	240
13	20638	21192	21744	22292	22836	23377	23915	24449	24980	25508	26033	26554	3	361
14	27073	27588	28100	28609	29116	29619	30120	30617	31112	31604	32093	32579	4	482
15	33063	33544	34023	34498	34972	35442	35910	36376	36839	37299	37758	38213	s	422
16	38667	39118	39567	40013	40457	40899	41339	41776	42211	42644	43075	43504	1	84
17	43930	44355	44777	45198	45616	46033	46447	46859	47270	47678	48085	48490	2	168
18	48893	49294	49693	50090	50486	50879	51271	51661	52050	52436	52821	53205	3	253
19	53586	53966	54344	54721	55096	55469	55841	56211	56580	56947	57313	57676	4	338
20	2.58039	58400	58759	59117	59474	59829	60182	60534	60885	61234	61582	61929	s	326
21	62274	62618	62960	63302	63641	63979	64316	64652	64987	65320	65652	65982	1	65
22	66312	66640	66967	67292	67617	67940	68262	68583	68903	69221	69538	69855	2	130
23	70170	70483	70796	71108	71418	71728	72036	72343	72649	72954	73258	73561	3	196
24	73863	74164	74464	74762	75060	75357	75652	75947	76241	76533	76825	77116	4	261
25	77405	77694	77982	78269	78555	78840	79124	79407	79689	79970	80251	80530	s	265
26	80809	81086	81363	81639	81914	82188	82461	82734	83005	83276	83546	83815	1	53
27	84083	84350	84617	84883	85148	85412	85675	85937	86199	86460	86720	86979	2	106
28	87238	87496	87753	88009	88265	88519	88773	89027	89279	89531	89782	90032	3	159
29	90282	90531	90779	91027	91273	91520	91765	92010	92254	92497	92739	92981	4	212
30	2.93223	93463	93703	93942	94181	94419	94656	94893	95129	95364	95599	95833	s	223
31	96067	96299	96532	96763	96994	97224	97454	97683	97912	98140	98367	98594	1	45
32	98820	99045	99270	99495	99719	99942	00164	00386	00608	00829	01049	01269	2	89
33	3.01488	01707	01925	02143	02360	02576	02792	03008	03222	03437	03651	03864	3	134
34	04077	04289	04501	04712	04922	05133	05342	05551	05760	05968	06176	06383	4	178
35	06590	06796	07001	07207	07411	07616	07819	08023	08225	08428	08629	08831	s	194
36	09032	09232	09432	09632	09831	10029	10227	10425	10622	10819	11015	11211	1	39
37	11406	11601	11796	11990	12184	12377	12570	12762	12954	13146	13337	13527	2	78
38	13718	13908	14097	14286	14475	14663	14850	15038	15225	15411	15597	15783	3	116
39	15969	16154	16338	16522	16706	16889	17072	17255	17437	17619	14800	17982	4	155
40	3.18162	18343	18522	18702	18881	19060	19238	19417	19594	19771	19949	20125	s	171
41	20301	20477	20653	20828	21003	21177	21351	21525	21699	21872	22044	22217	1	34
42	22389	22560	22732	22903	23073	23244	23414	23583	23753	23922	24090	24259	2	68
43	24427	24594	24762	24929	25095	25262	25428	25594	25759	25924	26089	26253	3	103
44	26418	26581	26745	26908	27071	27234	27396	27558	27720	27881	28042	28203	4	137
45	28363	28524	28683	28843	29002	29161	29320	29478	29637	29794	29952	30109	s	153
46	30266	30423	30579	30735	30891	31047	31202	31357	31512	31666	31820	31974	1	31
47	32128	32281	32434	32587	32739	32892	33044	33195	33347	33498	33649	33800	2	61
48	33950	34100	34250	34400	34549	34698	34847	34995	35144	35292	35439	35587	3	92
49	35734	35881	36028	36175	36321	36467	36613	36758	36903	37048	37193	37338	4	122
50	3.37482	37626	37770	37914	38057	38200	38343	38486	38628	38770	38912	39054	s	138
51	39195	39336	39477	39618	39759	39899	40039	40179	40319	40458	40597	40736	1	28
52	40875	41013	41152	41290	41427	41565	41702	41839	41976	42113	42250	42386	2	55
53	42522	42658	42794	42929	43064	43199	43334	43469	43603	43737	43871	44005	3	83
54	44138	44272	44405	44537	44670	44803	44935	45067	45199	45331	45462	45593	4	110
55	45724	45855	45986	46116	46247	46377	46507	46636	46766	46895	47024	47153	s	125
56	47282	47410	47539	47667	47795	47923	48050	48177	48305	48432	48558	48685	1	25
57	48811	48938	49064	49190	49315	49441	49566	49691	49816	49941	50066	50190	2	50
58	50314	50438	50562	50686	50809	50933	51056	51179	51301	51424	51547	51669	3	75
59	51791	51913	52035	52156	52278	52399	52520	52641	52761	52882	53002	53122	4	100

TABLE XXI.

LOG RISING, OR VERSED SINES.

RISING.

1 Hour.

M	0	5s	10s	15s	20s	25s	30s	35s	40s	45s	50s	55s	Pro. pts.	
0	3.53243	53362	53482	53602	53721	53840	53959	54078	54197	54315	54434	54552	s	115
1	54670	54788	54905	55023	55140	55258	55375	55492	55608	55725	55841	55958	1	23
2	56074	56190	56306	56421	56537	56652	56767	56882	56997	57112	57226	57341	2	46
3	57455	57569	57683	57797	57910	58024	58137	58250	58363	58476	58589	58702	3	69
4	58814	58926	59038	59150	59262	59374	59486	59597	59708	59819	59930	60041	4	92
5	60152	60262	60373	60483	60593	60703	60813	60923	61032	61143	61251	61360	s	107
6	61469	61578	61686	61795	61903	62012	62120	62228	62336	62443	62551	62659	1	21
7	62766	62873	62980	63087	63194	63301	63407	63513	63620	63726	63832	63938	2	43
8	64043	64149	64254	64360	64465	64570	64675	64780	64885	64989	65094	65198	3	64
9	65302	65406	65510	65614	65717	65821	65924	66028	66131	66234	66337	66440	4	85
10	3.66542	66645	66747	66849	66952	67054	67156	67257	67359	67461	67562	67663	s	99
11	67765	67866	67967	68067	68168	68269	68369	68469	68570	68670	68770	68870	1	20
12	68969	69069	69169	69268	69367	69467	69566	69665	69763	69862	69961	70059	2	40
13	70158	70256	70354	70452	70550	70648	70745	70843	70940	71038	71135	71232	3	60
14	71329	71426	71523	71620	71716	71813	71909	72005	72101	72197	72294	72389	4	80
15	72485	72580	72676	72771	72867	72962	73057	73152	73247	73341	73436	73530	s	92
16	73625	73719	73813	73907	74001	74095	74189	74283	84376	74470	74563	74657	1	17
17	74750	74843	74936	75029	75121	75214	75307	75399	75491	75584	75676	75768	2	37
18	75860	75952	76043	76135	76227	76318	76409	76501	76592	76683	76774	76865	3	55
19	76955	77046	77137	77227	77318	77408	77498	77588	77678	77768	77858	77947	4	73
20	3.78037	78127	78216	78305	78395	78484	78573	78662	78750	78839	78928	79016	s	87
21	79105	79193	79282	79370	79458	79546	79634	79722	79809	79897	79985	80072	1	17
22	80159	80247	80334	80421	80508	80595	80682	80768	80855	80942	81028	81115	2	35
23	81201	81287	81373	81459	81545	81631	81717	81802	81888	81974	82059	82144	3	52
24	82230	82315	82400	82485	82570	82655	82739	82824	82908	82993	83077	83162	4	70
25	83246	83330	83414	83498	83582	83666	83749	83833	83917	84000	84083	84167	s	82
26	84250	84333	84416	84499	84582	84665	84748	84830	84913	84995	85078	85160	1	16
27	85242	85324	85406	85488	85570	85652	85734	85816	85897	85979	86060	86141	2	33
28	86223	86304	86385	86466	86547	86628	86709	86790	86870	86951	87031	87112	3	49
29	87192	87272	87352	87433	87513	87593	87672	87752	87832	87912	87991	88071	4	65
30	3.88150	88229	88309	88388	88467	88546	88625	88704	88783	88862	88940	89019	s	77
31	89097	89176	89254	89333	89411	89489	89567	89645	89723	89801	89879	89956	1	15
32	90034	90112	90189	90267	90344	90421	90498	90576	90653	90730	90807	90884	2	31
33	90960	91037	91114	91190	91267	91343	91420	91496	91572	91648	91724	91800	3	46
34	91876	91952	92028	92104	92179	92255	92331	92406	92482	92557	92632	92707	4	62
35	92782	92858	92933	93007	93082	93157	93232	93306	93381	93456	93530	93605	s	73
36	93679	93753	93827	93901	93975	94049	94123	94197	94271	94345	94418	94492	1	15
37	94566	94639	94712	94786	94859	94932	95005	95078	95152	95224	95297	95370	2	29
38	95443	95515	95588	95661	95733	95806	95878	95950	96023	96095	96167	96239	3	44
39	96311	96383	96455	96527	96599	96670	96742	96813	96885	96956	97028	97099	4	58
40	3.97170	97242	97313	97384	97455	97526	97597	97667	97738	97809	97880	97950	s	70
41	98021	98091	98162	98232	98302	98372	98443	98513	98583	98653	98723	98793	1	14
42	98862	98932	99002	99072	99141	99211	99280	99350	99419	99488	99557	99627	2	28
43	99696	99765	99834	99903	99972	00040	00109	00178	00247	00315	00384	00452	3	42
44	4.00521	00589	00657	00726	00794	00862	00930	00998	01066	01134	01202	01270	4	56
45	01337	01405	01473	01540	01608	01675	01743	01810	01877	01945	02012	02079	s	66
46	02146	02213	02280	02347	02414	02481	02547	02614	02681	02747	02814	02880	1	13
47	02947	03013	03080	03146	03212	03278	03344	03411	03477	03542	03608	03674	2	26
48	03740	03806	03871	03937	04003	04068	04134	04199	04265	04330	04395	04460	3	40
49	04526	04591	04656	04721	04786	04851	04916	04980	05045	05110	05175	05239	4	53
50	4.05304	05368	05433	05497	05561	05626	05690	05754	05818	05882	05946	06010	s	63
51	06074	06138	06202	06266	06330	06393	06457	06521	06584	06648	06711	06775	1	13
52	06838	06901	06965	07028	07091	07154	07217	07280	07343	07406	07469	07532	2	25
53	07595	07657	07720	07783	07845	07908	07970	08033	08095	08157	08220	08282	3	38
54	08344	08406	08468	08530	08592	08654	08716	08778	08840	08902	08964	09025	4	50
55	09087	09148	09210	09272	09333	09394	09456	09517	09578	09640	09701	09762	s	60
56	09823	09884	09945	10006	10067	10128	10188	10249	10310	10371	10431	10492	1	12
57	10552	10613	10673	10734	10794	10854	10915	10975	11035	11095	11155	11215	2	24
58	11275	11335	11395	11455	11515	11575	11634	11694	11754	11813	11873	11932	3	36
59	11992	12051	12111	12170	12229	12289	12348	12407	12466	12525	12584	12643	4	48

TABLE XXI.

LOG RISING, OR VERSED SINES.

RISING.

2 Hours.

M	0s	5s	10s	15s	20s	25	30s	35s	40s	45s	50s	55s	Pro. pts.
0	4.12702	12761	12820	12879	12938	12996	13055	13114	13172	13231	13289	13348	s 57
1	13406	13465	13523	13581	13640	13698	13756	13814	13872	13931	13989	14047	1 11
2	14104	14162	14220	14278	14336	14394	14451	14508	14567	14625	14682	14739	2 23
3	14797	14854	14911	14969	15026	15083	15140	15198	15255	15312	15369	15426	3 34
4	15483	15540	15597	15653	15710	15767	15824	15880	15937	15994	16050	16107	4 46
5	16163	16220	16276	16332	16389	16445	16501	16557	16614	16670	16726	16782	s 55
6	16838	16894	16950	17006	17062	17117	17173	17229	17285	17340	17396	17451	1 11
7	17507	17563	17618	17673	17729	17784	17840	17895	17950	18005	18060	18116	2 22
8	18171	18226	18281	18336	18391	18445	18500	18555	18610	18665	18719	18774	3 33
9	18829	18883	18938	18992	19047	19101	19156	19210	19265	19319	19373	19427	4 44
10	4.19482	19536	19590	19644	19698	19752	19806	19860	19914	19968	20022	20075	s 53
11	20129	20183	20236	20290	20344	20397	20451	20505	20558	20611	20665	20718	1 11
12	20771	20825	20878	20931	20984	21037	21091	21144	21197	21250	21303	21356	2 21
13	21409	21461	21514	21567	21620	21673	21725	21778	21831	21883	21936	21988	3 32
14	22041	22093	22146	22198	22250	22303	22355	22407	22459	22511	22564	22616	4 42
15	22668	22720	22772	22824	22876	22928	22980	23031	23083	23135	23187	23238	s 51
16	23290	23342	23393	23445	23496	23548	23599	23651	23702	23754	23805	23856	1 10
17	23907	23959	24010	24061	14112	14163	24214	24265	24316	24367	24418	24469	2 20
18	24520	24571	24622	24673	24723	24774	24825	24875	24926	24977	25027	25078	3 31
19	25128	25178	25229	25279	25330	25380	25430	25481	25531	25581	25631	25681	4 41
20	4.25731	25781	25831	15881	25931	25981	26031	26081	26131	26181	26231	26281	s 49
21	26330	26380	26429	26479	26529	26578	26628	26677	26727	26776	26826	26875	1 10
22	26924	26974	27023	27072	27121	27171	27220	27269	27318	27367	27416	27465	2 20
23	27514	27563	27612	27661	27710	27759	27807	27856	27905	27954	28002	28051	3 29
24	28099	28148	28197	28245	28294	28342	28391	28439	28487	28536	28584	28632	4 39
25	28681	28729	28777	28825	28873	28921	28969	29017	29066	29114	29161	29209	s 47
26	29257	29305	29353	29401	29449	29496	29544	29592	29639	29687	29735	29782	1 9
27	29830	29877	29925	29973	30020	30067	30115	30162	30209	30257	30304	30351	2 19
28	30398	30445	30493	30540	30587	30634	30681	30728	30775	30822	30869	30916	3 28
29	30963	31009	31056	31103	31150	31197	31243	31290	31337	31383	31430	31476	4 38
30	4.31523	31569	31616	31662	31709	31755	31801	31848	31894	31940	31987	32033	s 45
31	32079	32125	32171	32217	32264	32310	32356	32402	32448	32494	32540	32586	1 9
32	32631	32677	32723	32769	32815	32860	32906	32952	32997	33043	33089	33134	2 18
33	33180	33225	33271	33316	33362	33407	33453	33498	33543	33589	33634	33679	3 27
34	33724	33770	33815	33860	33905	33950	33995	34040	34085	34130	34175	34220	4 36
35	34265	34310	34355	34400	34444	34489	34534	34579	34623	34668	34713	34757	s 44
36	34802	24847	34891	34936	34980	35025	35069	35114	35158	35202	35247	25291	1 9
37	35335	35380	35424	35468	35512	35556	35601	35645	35689	35733	35777	35821	2 18
38	35865	35909	35953	35997	36041	36085	36128	36172	36216	36260	36303	36347	3 27
39	36391	36435	36478	36522	36565	36609	36653	36696	36740	36783	36827	36870	4 35
40	4.36913	36957	37000	37043	37087	37130	37173	37216	37260	37303	37346	37389	s 43
41	37432	37475	37518	37561	37604	37647	37690	37733	37776	37819	37862	37905	1 9
42	37948	37990	38033	38076	38119	38161	38204	38247	38289	38332	38374	38417	2 17
43	38460	38502	38545	38587	38629	38672	38714	38757	38799	38841	38884	38926	3 26
44	38968	39010	39052	39095	39137	39179	39221	39263	39305	39347	39389	39431	4 34
45	39473	39515	39557	39599	39641	39683	39725	39766	39808	39850	39892	39933	s 41
46	39975	40017	40058	40100	40142	40183	40225	40266	40308	40349	40391	40482	1 8
47	40474	40515	40556	40598	40639	40680	40722	40763	40804	40845	40887	40928	2 16
48	40969	41010	41051	41092	41133	41174	41215	41256	41297	41338	41379	41420	3 25
49	41461	41502	41543	41583	41624	41665	41706	41746	41787	41828	41868	41909	4 33
50	4.41950	41990	42031	42071	42112	42153	42193	42233	42274	42314	42355	42395	s 40
51	42435	42476	42516	42556	42597	42637	42677	42717	42758	42798	42838	42878	1 8
52	42918	42958	42998	43038	43078	43118	43158	43198	43238	43278	43318	43358	2 16
53	43398	43437	43477	43517	43557	43597	43636	43676	43716	43755	43795	43835	3 24
54	43874	43914	43953	43993	44032	44072	44111	44151	44190	44229	44269	44308	4 32
55	44348	44387	44426	44465	44505	44544	44583	44622	44662	44701	44740	44779	s 39
56	44818	44857	44896	44935	44974	45013	45052	45091	45130	45169	45208	45247	1 8
57	45286	45325	45363	45402	45441	45480	45518	45557	45596	45634	45673	45712	2 16
58	45750	45789	45827	45866	45905	45943	45982	46020	46058	46097	46135	46174	3 23
59	46212	46250	46289	46327	46365	46404	46412	46480	46518	46556	46595	46633	4 31

TABLE XXI.

LOG RISING, OR VERSED SINES.

RISING.

3 Hours.

M	0^s	5^s	10^s	15^s	20^s	25^s	30^s	35^s	40^s	45^s	50^s	55^s	Pro. pts.
0	4.46671	46709	46747	46785	46823	46861	46899	46937	46975	47013	47051	47089	s 38
1	47127	47165	47203	47241	47278	47316	47354	47392	47430	47467	47505	47543	1 8
2	47580	47618	47656	47693	47731	47768	47806	47843	47881	47918	47956	47993	2 15
3	48031	48068	48106	48143	48180	48218	48255	48292	48330	48367	48404	48441	3 23
4	48479	48516	48553	48590	48627	48664	48701	48739	48776	48813	48850	48887	4 30
5	48924	48961	48998	49035	49071	49108	49145	49182	49219	49256	49293	49329	s 36
6	49366	49403	49440	49476	49513	49550	49586	49623	49660	49696	49733	49769	1 7
7	49806	49842	49879	49915	49952	49988	50025	50061	50098	50134	50170	50207	2 15
8	50243	50279	50316	50342	50388	50424	50461	50497	50533	50569	50605	50641	3 22
9	50677	50714	50750	50786	50822	50858	50894	50930	50966	51002	51038	51073	4 29
10	4.51109	51145	51181	51217	51253	51289	51324	51360	51396	51432	51467	51503	s 35
11	51539	51574	51610	51646	51681	51717	51753	51788	51824	51859	51895	51930	1 7
12	51966	52001	52037	52072	52107	52143	52178	52213	52249	52284	52319	52355	2 14
13	52390	52425	52461	52496	52531	52566	52601	52636	52672	52707	52742	52777	3 21
14	52812	52847	52882	52917	52952	52987	53022	53057	53092	53127	53162	53197	4 28
15	53231	53266	53301	53336	53371	53405	53440	53475	53510	53544	53579	53614	s 34
16	53648	53683	53718	53752	53787	53821	53856	53891	53925	53960	53994	54029	1 7
17	54063	54097	54132	54166	54201	54235	54269	54304	54338	54372	54407	54441	2 14
18	54475	54509	54544	54578	54612	54646	54680	54715	54749	54783	54817	54851	3 20
19	54885	54919	54953	54987	55021	55055	55089	55123	55157	55191	55225	55259	4 26
20	4.55293	55327	55360	55394	55428	55462	55496	55529	55563	55597	55630	55664	s 33
21	55698	55732	55765	55799	55832	55866	55900	55933	55967	56000	56034	56067	1 7
22	56101	56134	56168	56201	56235	56268	56301	56335	56368	56401	56435	56468	2 13
23	56501	56534	56568	56601	56635	56668	56701	56734	56767	56800	56834	56867	3 20
24	56900	56933	56966	56999	57032	57065	57098	57131	57164	57197	57230	57263	4 27
25	57296	57329	57362	57395	57428	57460	57493	57526	57559	57592	57625	57657	s 32
26	57690	57723	57755	57788	57821	57854	57886	57919	57951	57984	58017	58049	1 6
27	58082	58114	58147	58179	58212	58244	58277	58309	58342	58374	58407	58439	2 13
28	58471	58504	58536	58568	58601	58633	58665	58698	58730	58762	58794	58827	3 19
29	58859	58891	58923	58955	58988	59020	59052	59084	59116	59148	59180	59212	4 26
30	4.59244	59276	59308	59340	59372	59404	59436	59468	59500	59532	59564	59596	s 32
31	59627	59659	59691	59723	59755	59786	59818	59850	59882	59913	59945	59977	1 6
32	60008	60040	60072	60103	60135	60167	60198	60230	60261	60293	60324	60356	2 13
33	60388	60419	60450	60482	60513	60545	60576	60608	60639	60670	60701	60733	3 19
34	60764	60796	60827	60858	60890	60921	60952	60983	61015	61046	61077	61108	4 26
35	61139	61171	61202	61233	61264	61295	61326	61357	61388	61419	61450	61481	s 31
36	61512	61543	61574	61605	61636	61667	61698	61729	61760	61791	61822	61852	1 6
37	61883	61914	61945	61976	62006	62037	62068	62099	62129	62160	62191	62222	2 12
38	62252	62283	62313	62344	62375	62405	62436	62466	62497	62528	62558	62589	3 19
39	62619	62650	62680	62711	62741	62771	62802	62832	62863	62893	62923	62954	4 25
40	4.62984	63014	63045	63075	63105	63136	63166	63196	63226	63257	63287	63317	s 30
41	63347	63377	63407	63438	63468	63498	63528	63558	63588	63618	63648	63678	1 6
42	63708	63738	63768	63798	63828	63858	63888	63918	63948	63978	64008	64038	2 12
43	64068	64097	64127	64157	64187	64217	64246	64276	64306	64336	64365	64395	3 18
44	64425	64455	64484	64514	64544	64573	64603	64632	64662	64692	64721	64751	4 24
45	64780	64810	64839	64869	64898	64928	64957	64987	65016	65045	65075	65105	s 29
46	65134	65163	65193	65222	65251	65281	65310	65339	65369	65398	65427	65456	1 6
47	65486	65515	65544	65573	65603	65632	65661	65690	65719	65748	65777	65806	2 12
48	65836	65865	65894	65923	65952	65981	66010	66039	66068	66097	66126	66155	3 17
49	66184	66213	66242	66270	66299	66328	66357	66386	66415	66444	66472	66501	4 23
50	4.66530	66559	66588	66616	66645	66674	66702	16731	66760	66789	66817	66846	s 29
51	66875	66903	66932	66960	66989	67018	67046	67075	67103	67132	67160	67189	1 6
52	67217	67246	67274	67303	67331	67360	67388	67416	67445	67473	67502	67530	2 12
53	67558	67587	67615	67643	67672	67700	67728	67756	67785	67813	67841	67869	3 17
54	67897	67925	67954	67982	68010	68038	68066	68094	68123	68151	68179	67207	4 23
55	68235	68263	68291	68319	68347	68375	68403	68431	68459	68487	68515	68543	s 28
56	68571	68599	68627	68654	68682	68710	68738	68766	68794	68821	68849	68877	1 6
57	68905	68933	68960	68988	69016	69043	69071	69099	69127	69154	69182	69210	2 11
58	69237	69265	69292	69320	69348	69375	69403	69430	69458	69486	69513	69540	3 17
59	69568	69595	69623	69650	69678	69705	69733	69760	69788	69815	69842	69870	4 22

TABLE XXI.

LOG RISING, OR VERSED SINES.

RISING.

4 Hours.

M	0s	5s	10s	15s	20s	25s	30s	35s	40s	45	50s	55s
0	4.69897	69924	69952	69979	70006	70034	70061	70088	70115	70143	70170	7019
1	70224	70252	70279	70306	70333	70360	70387	70415	70442	70469	70496	7052
2	70550	70577	70604	70631	70658	70685	70712	70739	70766	70793	70820	7084
3	70874	70901	70928	70955	70982	71009	71036	71063	71089	71116	71143	7117
4	71197	71224	71250	71277	71304	71331	71357	71384	71411	71438	71464	7149
5	71518	71544	71571	71598	71624	71651	71678	71704	71731	71757	71784	7181
6	71837	71864	71890	71917	71943	71970	71996	72023	72049	72075	72102	7212
7	72155	72181	72208	72234	72260	72287	72313	72339	72366	72392	72418	7244
8	72471	72497	72523	72550	72576	72602	72628	72655	72681	72707	72733	7275
9	72785	72812	72838	72864	72890	72916	72942	72968	72994	73020	73046	7307
10	4.73099	73125	73151	73177	73203	73228	73254	73280	73306	73332	73358	7338
11	73410	73436	73462	73488	73514	73539	73565	73591	73617	73643	73668	7369
12	73720	73746	73772	73797	73823	73849	73874	73900	73926	73951	73977	7400
13	74028	74054	74080	74105	74131	74157	74182	74208	74233	74259	74284	7431
14	74335	74361	74386	74412	74437	74463	74488	74514	74539	74565	74590	7461
15	74641	74666	74692	74717	74742	74768	74793	74818	74844	74869	74894	7492
16	74945	74970	74995	75021	75046	75071	75096	75122	75147	75172	75197	7522
17	75247	75273	75298	75323	75348	75373	75398	75423	75448	75473	75498	7552
18	75549	75574	75599	75624	75649	75674	75699	75723	75748	75773	75798	7582
19	75848	75873	75898	75923	75948	75973	75997	76022	76047	76072	76097	7612
20	4.76146	76171	76196	76221	76245	76270	76295	76320	76344	76369	76394	7641
21	76443	76468	76492	76517	76542	76566	76591	76615	76640	76665	76689	7671
22	76738	76763	76787	76812	76836	76861	76885	76910	76934	76959	76983	7700
23	77032	77057	77081	77105	77130	77154	77179	77203	77227	77252	77276	7730
24	77325	77349	77373	77398	77422	77446	77470	77495	77519	77543	77567	7759
25	77616	77640	77664	77688	77713	77737	77761	77785	77809	77833	77857	7788
26	77906	77930	77954	77978	78002	78026	78050	78074	78098	78122	78146	7817
27	78194	78218	78242	78266	78290	78314	78338	78361	78385	78409	78433	7845
28	78481	78505	78529	78552	78576	78600	78624	78648	78671	78695	78719	7874
29	78767	78790	78814	78838	78861	78885	78909	78933	78956	78980	79004	7902
30	4.79051	79074	79098	79122	79145	79169	79192	79216	79240	79263	79287	7931
31	79334	79357	79381	79404	79428	79451	79475	79498	79522	79545	79568	7959
32	79615	79639	79662	79686	79709	79732	79756	79779	79802	79826	79849	7987
33	79896	79919	79942	79965	79989	80012	80035	80059	80082	80105	80128	8015
34	80175	80198	80221	80244	80267	80290	80314	80337	80360	80383	80406	8042
35	80452	80475	80498	80521	80545	80568	80591	80614	80637	80660	80685	8070
36	80729	80752	80775	80797	80820	80843	80866	80889	80912	80935	80958	8098
37	81004	81027	81049	81072	81095	81118	81141	81163	81186	81209	81232	8125
38	81277	81300	81323	81346	81368	81391	81414	81437	81459	81482	81505	8152
39	81550	81573	81595	81618	81641	81663	81686	81708	81731	81754	81776	8179
40	4.81821	81844	81866	81889	81911	81934	81956	81979	82001	82024	82046	8206
41	82091	82114	82136	82159	82181	82203	82226	82248	82271	82293	82315	8233
42	82360	82382	82405	82427	82449	82472	82494	82516	82538	82561	82583	8260
43	82628	82650	82672	82694	82716	82739	82761	82783	82805	82827	82850	8287
44	82894	82916	82938	82960	82982	83004	83026	83049	83071	83093	83115	8313
45	83159	83181	83203	83225	83247	83269	83291	83313	83335	83357	83379	83401
46	83423	83445	83467	83488	83510	83532	83554	83576	83598	83620	83642	8366
47	83685	83707	83729	83751	83773	83794	83816	83838	83860	83881	83903	8392
48	83947	83968	83990	84012	84034	84055	84077	84099	84120	84142	84164	8418
49	84207	84229	84250	84272	84293	84315	84337	85358	84380	84401	84423	8444
50	4.84466	84488	84509	84531	84552	84574	84595	84617	84638	84659	84681	8470
51	84724	84745	84767	84788	84810	84831	84852	84874	84895	84916	84938	8495
52	84981	85002	85023	85044	85066	85087	85108	85130	85151	85172	85194	85215
53	85236	85257	85278	85300	85321	85342	85363	85385	85406	85427	85448	85469
54	85490	85512	85533	85554	85575	85596	85617	85638	85659	85680	85701	85722
55	85744	85765	85786	85807	85828	85849	85870	85891	85912	85933	85954	85975
56	85996	86017	86038	86058	86079	86100	86121	86142	86163	86184	86205	86226
57	86247	86267	86288	86309	86330	86351	86372	86392	86413	86434	86455	86475
58	86496	86517	86538	86559	86579	86600	86621	86641	86662	86683	86704	86724
59	86745	86766	86786	86807	86828	86848	86869	86889	86910	86931	86951	86972

TABLE XXI.

LOG RISING, OR VERSED SINES.

RISING.

5 Hours.

M	0s	5s	10s	15s	20s	25s	30s	35s	40s	45s	50s	55s	Pro. pts.
0	4.86992	87013	87034	87054	87075	87095	87116	87136	87157	87177	87198	87218	s 20
1	87239	87259	87280	87300	87321	87341	87362	87382	87402	87423	87443	87464	1 4
2	87484	87505	87525	87545	87566	87586	87606	87627	87647	87667	87688	87708	2 8
3	87728	87749	87769	87789	87809	87830	87850	87870	87890	87911	87931	87951	3 12
4	87971	87992	88012	88032	88052	88072	88093	88113	88133	88153	88173	88193	4 16
5	88213	88234	88254	88274	88294	88314	88334	88354	88374	88394	88414	88434	s 20
6	88454	88474	88494	88514	88534	88554	88574	88594	88614	88634	88654	88674	1 4
7	88694	88714	88734	88754	88774	88794	88814	88834	88853	88873	88893	88913	2 8
8	88933	88953	88973	88992	89012	89032	89052	89072	89091	89111	89131	89151	3 12
9	89171	89190	89210	89230	89250	89269	89289	89309	89328	89348	89368	89388	4 16
10	4.89407	89427	89447	89466	89486	89506	89525	89545	89564	89584	89604	89623	s 19
11	89643	89662	89682	89702	89721	89741	89760	89780	89799	89819	89838	89858	1 4
12	89877	89897	89916	89936	89955	89975	89994	90014	90033	90053	90072	90091	2 8
13	90111	90130	90150	90169	90188	90208	90227	90247	90266	90285	90305	90324	3 12
14	90343	90363	90382	90401	90421	90440	90459	90478	90498	90517	90536	90555	4 16
15	90575	90594	90613	90632	90652	90671	90690	90709	90728	90748	90767	90786	s 19
16	90805	90824	90843	90863	90882	90901	90920	90939	90958	90977	90996	91015	1 4
17	91034	91054	91073	91092	91111	91130	91149	91168	91187	91206	91225	91244	2 8
18	91263	91282	91301	91320	91339	91358	91377	91396	91414	91433	91452	91471	3 11
19	91490	91509	91528	91547	91566	91585	91603	91622	91641	91660	91679	91698	4 15
20	4.91716	91735	91754	91773	91792	91811	91829	91848	91867	91886	91904	91923	s 18
21	91942	91961	91979	91998	92017	92035	92054	92073	92092	92110	92129	92148	1 4
22	92166	92185	92203	92222	92241	92259	92278	92297	92315	92334	92352	92371	2 8
23	92390	92408	92427	92445	92464	92483	92501	92519	92538	92556	92575	92593	3 11
24	92612	92630	92649	92667	92686	92704	92723	92741	92760	92778	92796	92815	4 15
25	92833	92851	92870	92888	92907	92925	92944	92962	92980	92999	93017	93035	s 18
26	93054	93072	93090	93109	93127	93145	93164	93182	93200	93218	93237	93255	1 4
27	93273	93291	93310	93328	93346	93364	93382	93401	93419	93437	93455	93473	2 7
28	93492	93510	93528	93546	93564	93582	93600	93619	93637	93655	93673	93691	3 11
29	93709	93727	93745	93763	93781	93809	93817	93836	93854	93872	93890	93908	4 14
30	4.93926	93944	93962	93980	93998	94016	94034	94052	94069	94088	94105	94123	s 18
31	94141	94159	94177	94195	94213	94231	94249	94267	94284	94302	94320	94338	1 4
32	94356	94374	94392	94410	94427	94445	94463	94481	94498	94516	94534	94552	2 7
33	94570	94587	94605	94623	94641	94658	94676	94694	94711	94729	94747	94765	3 11
34	94782	94800	94818	94835	94853	94871	94888	94906	94924	94941	94959	94976	4 14
35	94994	95012	95029	95047	95065	95082	95100	95117	95135	95153	95170	95188	s 17
36	95205	95223	95240	95258	95275	95293	95310	95328	95345	95363	95380	95398	1 3
37	95415	95433	95450	95468	95485	95502	95520	95537	95555	95572	95589	95607	2 7
38	95624	95642	95659	95676	95694	95711	95728	95746	95763	95780	95798	95815	3 10
39	95832	95850	95867	95884	95902	95919	95936	95953	95971	95988	96005	96022	4 15
40	4.96040	96057	96074	96091	96109	96126	96143	96160	96177	96195	96212	96229	s 17
41	96246	96263	96280	96297	96315	96332	96349	96366	96383	96400	96417	96434	1 3
42	96451	96469	96486	96503	96520	96537	96554	96571	96588	96605	96622	96639	2 7
43	96656	96673	96690	96707	96724	96741	96758	96775	96792	96809	96826	96843	3 10
44	96860	96877	96894	96910	96927	96944	96961	96978	96995	97012	97029	97046	4 14
45	97062	97079	97096	97113	97130	97147	97163	97180	97197	97214	97231	97247	s 17
46	97264	97281	97298	97315	97331	97348	97365	97382	97398	97415	97432	97449	1 3
47	97465	97482	97499	97515	97532	97549	97565	97582	97599	97615	97632	97649	2 7
48	97665	97682	97699	97715	97732	97749	97765	97782	97798	97815	97832	97848	3 10
49	97865	97881	97898	97914	97931	97947	97964	97981	97997	98014	98030	98047	4 13
50	4.98063	98080	98096	98113	98129	98145	98162	98178	98195	98211	98228	98244	s 16
51	98261	98277	98293	98310	98326	98343	98359	98375	98392	98408	98425	98441	1 3
52	98457	98474	98490	98506	98523	98539	98555	98572	98588	98604	98620	98637	2 7
53	98653	98669	98686	98702	98718	98734	98751	98767	98783	98799	98816	98832	3 10
54	98848	98864	98880	98897	98913	98929	98945	98961	98977	98994	99010	99026	4 13
55	99042	99058	99074	99090	99107	99123	99139	99155	99171	99187	99203	99219	s 16
56	99235	99251	99267	99284	99300	99316	99332	99348	99364	99380	99396	99312	1 3
57	99428	99444	99460	99476	99492	99508	99524	99540	99556	99572	99587	99603	2 6
58	99619	99635	99651	99667	99683	99799	99715	99731	99747	99763	99778	99794	3 10
59	99810	99826	99842	99858	99873	99889	99905	99231	99937	99953	99968	99984	4 13

TABLE XXI.

LOG RISING, OR VERSED SINES.

RISING.

6 Hours.

M	0^s	5^s	10^s	15^s	20^s	25^s	30^s	35^s	40^s	45^s	50^s	55^s	Pro. pts.
0	5.00000	00016	00032	00047	00063	00079	00095	00110	00126	00142	00158	00173	s 16
1	00189	00205	00221	00236	00252	00268	00283	00299	00315	00330	00346	00362	1 3
2	00377	00393	00409	00424	00440	00456	00471	00487	00502	00518	00534	00549	2 6
3	00565	00580	00596	00612	00627	00643	00658	00674	00689	00705	00720	00736	3 9
4	00751	00767	00782	00798	00813	00829	00844	00860	00875	00891	00906	00922	4 12
5	00937	00953	00968	00984	00999	01014	01030	01045	01061	01076	01091	01107	s 15
6	01122	01138	01153	01168	01184	01199	01214	01230	01245	01260	01276	01291	1 3
7	01306	01322	01337	01352	01368	01383	01398	01413	01429	01444	01459	01474	2 6
8	01490	01505	01520	01536	01551	01566	01581	01596	01612	01627	01642	01657	3 9
9	01672	01688	01703	01718	01733	01748	01763	01779	01794	01809	01824	01839	4 12
10	5.01854	01869	01884	01900	01915	01930	01945	01960	01975	01990	02005	02020	s 15
11	02035	02050	02065	02080	02095	02110	02125	02140	02155	02170	02185	02200	1 3
12	02215	02230	02245	02260	02275	02290	02305	02320	02335	02350	02365	02380	2 6
13	02395	02410	02425	02440	02455	02469	02484	02499	02514	02529	02544	02559	3 9
14	02574	02588	02603	02618	02633	02648	02663	02677	02692	02707	02722	02737	4 12
15	02751	02766	02781	02796	02811	02825	02840	02855	02870	02884	02899	02914	s 15
16	02928	02943	02958	02973	02987	03002	03017	03031	03046	03061	03075	03090	1 3
17	03105	03119	03134	03149	03163	03178	03193	03207	03222	03237	03251	03266	2 6
18	03280	03295	03310	03324	03339	03353	03368	03382	03397	03412	03426	03441	3 9
19	03455	03470	03484	03499	03513	03528	03542	03557	03571	03586	03600	03615	4 12
20	5.03629	03644	03658	03672	03687	03701	03716	03730	04745	03759	03774	03788	s 14
21	03802	03817	03831	03846	03860	03874	03889	03903	05918	03932	03946	03961	1 3
22	03975	03989	04004	04018	04032	04047	04061	04075	04090	04104	04118	04132	2 6
23	04147	04161	04175	04190	04204	04218	04232	04247	04261	04275	04289	04303	3 9
24	04318	04332	04346	04360	04375	04389	04403	04417	04431	04445	04460	04474	4 12
25	04488	04502	04516	04530	04545	04559	04573	04587	04601	04615	04629	04643	s 14
26	04657	04672	04686	04700	04714	04728	04742	04756	04770	04784	04798	04812	1 3
27	04826	04840	04854	04868	04882	04896	04910	04924	04938	04952	04966	04980	2 6
28	04994	05008	05022	05036	05050	05064	05078	05092	05106	05120	05134	05148	3 9
29	05162	05175	05189	05203	05217	05231	05245	05259	05273	05286	05300	05314	4 11
30	5.05328	05342	05356	05370	05383	05397	05411	05425	05439	05452	05466	05480	s 14
31	05494	05508	05521	05535	05549	05563	05577	05590	05604	05618	05632	05645	1 3
32	05659	05673	05686	05700	05714	05728	05741	05755	05769	05782	05796	05810	2 6
33	05823	05837	05851	05864	05878	05892	05905	05919	05933	05946	05960	05973	3 8
34	05987	06001	06014	06028	06041	06055	06069	06082	06096	06109	06123	06136	4 11
35	06150	06163	06177	06191	06204	06218	06231	06245	06258	06272	06285	06299	s 13
36	06312	06326	06339	06353	06366	06379	06393	06406	06420	06433	06447	06460	1 3
37	06474	06487	06500	06514	06527	06541	06554	06567	06581	06594	06608	06621	2 5
38	06634	06648	06661	06674	06688	06701	06714	06728	06741	06754	06768	06781	3 8
39	06794	06808	06621	06834	06848	06861	06874	06887	06901	06914	06927	06941	4 11
40	5.06954	06967	06980	06994	07007	07020	07033	07046	07060	07073	07086	07099	s 13
41	07112	07126	07139	07152	07165	07178	07192	07205	07218	07231	07244	07257	1 3
42	07270	07284	07297	07310	07323	07336	07349	07362	07375	07388	07401	07415	2 5
43	07428	07441	07454	07467	07480	07493	07506	07519	07532	07545	07558	07571	3 8
44	07584	07597	07610	07623	07636	07649	07662	07675	07688	07701	07714	07727	4 10
45	07740	07753	07766	07779	07792	07805	07818	07831	07844	07857	07869	07882	s 13
46	07895	07908	07921	07934	07947	07960	07973	07985	07998	08011	08024	08037	1 3
47	08050	08063	08075	08088	08101	08114	08127	08140	08152	08165	08178	08191	2 5
48	08204	08216	08229	08242	08255	08267	08280	08293	08306	08318	08331	08344	3 8
49	08357	08369	08382	08395	08408	08420	08433	08446	08458	08471	08484	08496	4 10
50	5.08509	08522	08534	08547	08560	08572	08585	08598	08610	08623	08636	08648	s 13
51	08661	08673	08686	08699	08711	08724	08736	08749	08762	08774	08787	08799	1 3
52	08812	08824	08837	08850	08862	08875	08887	08900	08912	08925	08937	08950	2 5
53	08962	08975	08987	09000	09012	09025	09037	09050	09062	09075	09087	09100	3 8
54	09112	09124	09137	09149	09162	09174	09187	09199	09211	09224	09236	09249	4 10
55	09261	09273	09286	09298	09311	09323	09335	09348	09360	09372	09385	09397	s 12
56	09409	09422	09434	09446	09459	09471	09483	09196	09508	09520	09533	09545	1 2
57	09557	09569	09582	09594	09606	09618	09631	09643	09655	09667	09680	09692	2 5
58	09704	09716	09729	09741	09753	09765	09777	09790	09802	09814	09826	09838	3 7
59	09851	09863	09875	09887	09899	09911	09924	09936	09948	09960	09972	09984	4 10

TABLE XXI.

LOG RISING, OR VERSED SINES.

RISING.

7 Hours.

M	0s	5s	10s	15s	20s	25s	30s	35s	40s	45s	50s	55s	Pro. pts.	
0	5.09996	10008	10021	10033	10045	10057	10069	10081	10093	10105	10117	10129	s	12
1	10141	10153	10166	10178	10190	10202	10214	10226	10238	10250	10262	10274	1	2
2	10286	10298	10310	10322	10334	10346	10358	10370	10382	10394	10406	10418	2	5
3	10430	10441	10454	10465	10477	10489	10501	10513	10525	10537	10549	10561	3	7
4	10573	10585	10597	10608	10620	10632	10644	10656	10668	10680	10691	10703	4	10
5	10715	10727	10739	10751	10763	10774	10786	10798	10810	10822	10833	10484	s	12
6	10857	10869	10881	10893	10904	10916	10928	10940	10951	10963	10975	10986	1	2
7	10998	11010	11022	11033	11045	11057	11069	11080	11092	11104	11115	11127	2	5
8	11139	11150	11162	11174	11185	11197	11209	11220	11232	11244	11255	11267	3	7
9	11279	11290	11302	11314	11325	11337	11348	11360	11372	11383	11395	11406	4	10
10	5.11418	11429	11441	11453	11464	11476	11487	11499	11510	11522	11533	11545	s	12
11	11557	11568	11580	11591	11603	11614	11626	11637	11649	11660	11672	11683	1	2
12	11695	11706	11717	11729	11740	11752	11763	11775	11786	11798	11809	11820	2	5
13	11832	11843	11855	11866	11878	11889	11900	11912	11923	11934	11946	11957	3	7
14	11969	11980	11991	12003	12014	12025	12037	12048	12059	12071	12082	12093	4	9
15	12105	12116	12127	12139	12150	12161	12173	12184	12195	12206	12218	12229	s	11
16	12240	12251	12263	12274	12285	12296	12308	12319	12330	12341	12353	12364	1	2
17	12375	12386	12397	12409	12420	12431	12442	12453	12465	12476	12487	12498	2	5
18	12509	12520	12532	12543	12554	12565	12576	12587	12598	12610	12621	12632	3	7
19	12643	12654	12665	12676	12687	12698	12709	12721	12732	12743	12754	12765	4	9
20	5.12776	12787	12798	12809	12820	12831	12842	12853	12864	12875	12886	12897	s	11
21	12908	12919	12930	12941	12952	12963	12974	12985	12996	13007	13018	13029	1	2
22	13040	13051	13062	13073	13084	13095	13106	13117	13128	13139	13149	13160	2	4
23	13171	13182	13193	13204	13215	13226	13237	13248	13258	13269	13280	13291	3	7
24	13302	13313	13323	13334	13345	13356	13367	13378	13388	13399	13410	13421	4	9
25	13432	13442	13453	13464	13475	13486	13496	13507	13518	13529	13539	13550	s	11
26	13561	13572	13582	13593	13604	13615	13625	13636	13647	13658	13668	13679	1	2
27	13690	13700	13711	13722	13732	13743	13754	13765	13775	13786	13797	13807	2	4
28	13818	13828	13839	13850	13860	13871	13882	13892	13903	13914	13924	13935	3	7
29	13945	13956	13967	13977	13988	13998	14009	14019	14030	14041	14051	14062	4	9
30	5.14072	14083	14093	14104	14114	14125	14136	14146	14157	14167	14178	14188	s	11
31	14199	14209	14220	14230	14241	14251	14262	14272	14282	14293	14303	14314	1	2
32	14324	14335	14345	14356	14366	14377	14387	14397	14408	14418	14429	14439	2	4
33	14449	14460	14470	14481	14491	14501	14512	14522	14533	14543	14553	14564	3	6
34	14574	14584	14595	14605	14615	14626	14636	14646	14657	14667	14677	14688	4	9
35	14698	14708	14719	14729	14739	14750	14760	14770	14780	14790	14801	14811	s	10
36	14821	14832	14842	14852	14862	14872	14883	14893	14903	14913	14924	14934	1	2
37	14944	14954	14964	14975	14985	14995	15005	15015	15026	15036	15046	15056	2	4
38	15066	15076	15087	15097	15107	15117	15127	15137	15147	15157	15168	15178	3	6
39	15188	15198	15208	15218	15228	15238	15248	15258	15269	15279	15289	15299	4	8
40	5.15309	15319	15329	15339	15349	15359	15369	15379	15389	15399	15409	15419	s	10
41	15429	15439	15449	15459	15469	15479	15489	15499	15509	15519	15529	15539	1	2
42	15549	15559	15569	15579	15589	15599	15609	15619	15629	15639	15649	15659	2	4
43	15668	15678	15688	15698	15708	15718	15728	15738	15748	15758	15767	15777	3	6
44	15787	15797	15807	15817	15827	15837	15846	15856	15866	15876	15886	15896	4	8
45	15905	15915	15925	15935	15944	15954	15964	15974	15984	15993	16003	16013	s	10
46	16023	16033	16042	16052	16062	16072	16081	16091	16101	16111	16120	16130	1	2
47	16140	16149	16159	16169	16179	16188	16198	16208	16217	16227	16237	16246	2	4
48	16256	16266	16276	16285	16295	16304	16314	16324	16333	16343	16353	16362	3	6
49	16372	16382	16391	16401	16410	16420	16430	16439	16449	16459	16468	16478	4	8
50	5.16487	16497	16506	16516	16526	16535	16545	16554	16564	16573	16583	16592	s	10
51	16602	16612	16621	16631	16640	16650	16659	16669	16678	16688	16697	16707	1	2
52	16716	16726	16735	16745	16754	16764	16773	16782	16792	16801	16811	16820	2	4
53	16830	16839	16849	16858	16867	16877	16886	16896	16905	16915	16924	16933	3	6
54	16943	16952	16961	16971	16980	16990	16999	17008	17018	17027	17036	17046	4	8
55	17055	17065	17074	17083	17093	17102	17111	17121	17130	17139	17148	17158	s	9
56	17167	17176	17186	17195	17204	17214	17223	17232	17241	17251	17260	17269	1	2
57	17278	17288	17297	17306	17315	17325	17334	17343	17352	17362	17371	17380	2	4
58	17389	17398	17408	17417	17426	17435	17444	17454	17463	17472	17481	17490	3	6
59	17499	17509	17518	17527	17536	17545	17554	17563	17573	17582	17591	17600	4	8

TABLE XXII.

CORRECTION OF THE MOON'S APPARENT ALTITUDE.

☽ App altit.		Horizontal Parallax.								Prop. parts for Seconds of Par.										
		54′	55′	56′	57′	58′	59′	60′	61′		0″	1″	2″	3″	4″	5″	6″	7″	8″	9″
°	′	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	″	″	″	″	″	″	″	″	″	″	″
3	0	39 21	40 20	41 20	42 20	43 20	44 20	45 20	46 20	0	0	1	2	3	4	5	6	7	8	9
	10	39 52	40 52	41 52	42 52	43 51	44 51	45 51	46 51	10	10	11	12	13	14	15	16	17	18	19
	20	40 21	41 21	42 21	43 21	44 21	45 21	46 21	47 20	20	20	21	22	23	24	25	26	27	28	29
	30	40 49	41 49	42 48	43 48	44 48	45 48	46 48	47 48	30	30	31	32	33	34	35	36	37	38	39
	40	41 15	42 14	43 14	44 14	45 14	46 14	47 14	48 14	40	40	41	42	43	44	45	46	47	48	49
	50	41 39	42 39	43 39	44 39	45 38	46 38	47 38	48 38	50	50	51	52	53	54	55	56	57	58	59
4	0	42 2	43 2	44 2	45 1	46 1	47 1	48 1	49 1	0	0	1	2	3	4	5	6	7	8	9
	10	42 24	43 23	44 23	45 23	46 23	47 23	48 23	49 22	10	10	11	12	13	14	15	16	17	18	19
	20	42 44	43 44	44 44	45 43	46 42	47 43	48 43	49 43	20	20	21	22	23	24	25	26	27	28	29
	30	43 3	44 3	45 3	46 3	47 2	48 2	49 2	50 2	30	30	31	32	33	34	35	36	37	38	39
	40	43 21	44 21	45 21	46 21	47 21	48 20	49 20	50 20	40	40	41	42	43	44	45	46	47	48	49
	50	43 39	44 38	45 38	46 38	47 38	48 37	49 37	50 37	50	50	51	52	53	54	55	56	57	58	59
5	0	43 55	44 54	45 54	46 54	47 54	48 54	49 53	50 53	0	0	1	2	3	4	5	6	7	8	9
	10	44 10	45 10	46 10	47 9	48 9	49 9	50 9	51 8	10	10	11	12	13	14	15	16	17	18	19
	20	44 25	45 24	46 24	47 24	48 24	49 23	50 23	51 23	20	20	21	22	23	24	25	26	27	28	29
	30	44 38	45 38	46 38	47 38	48 37	49 37	50 37	51 36	30	30	31	32	33	34	35	36	37	38	39
	40	44 51	45 51	46 51	47 51	48 50	49 50	50 50	51 49	40	40	41	42	43	44	45	46	47	48	49
	50	45 4	46 3	47 3	48 3	49 3	50 2	51 2	52 2	50	50	51	52	53	54	55	56	57	58	59
6	0	45 16	46 15	47 15	48 15	49 14	50 14	51 14	52 13	0	0	1	2	3	4	5	6	7	8	9
	10	45 27	46 26	47 26	48 26	49 25	50 25	51 25	52 24	10	10	11	12	13	14	15	16	17	18	19
	20	45 37	46 37	47 37	48 36	49 36	50 35	51 35	52 35	20	20	21	22	23	24	25	26	27	28	29
	30	45 47	46 47	47 47	48 46	49 46	50 45	51 45	52 45	30	30	31	32	33	34	35	36	37	38	39
	40	45 57	46 57	47 56	48 56	49 55	50 55	51 55	52 54	40	40	41	42	43	44	45	46	47	48	49
	50	46 6	47 6	48 5	49 5	50 4	51 4	52 4	53 3	50	50	51	52	53	54	55	56	57	58	59
7	0	46 15	47 14	48 14	49 13	50 13	51 13	52 12	53 12	0	0	1	2	3	4	5	6	7	8	9
	10	46 23	47 23	48 22	49 22	50 21	51 21	52 20	53 20	10	10	11	12	13	14	15	16	17	18	19
	20	46 31	47 30	48 30	49 29	50 29	51 28	52 28	53 27	20	20	21	22	23	24	25	26	27	28	29
	30	46 38	47 38	48 37	49 37	50 36	51 36	52 35	53 35	30	30	31	32	33	34	35	36	37	38	39
	40	46 45	47 45	48 44	49 44	50 43	51 43	52 42	53 42	40	40	41	42	43	44	45	46	47	48	49
	50	46 52	47 52	48 51	49 51	50 50	51 49	52 49	53 48	50	50	51	52	53	54	55	56	57	58	59
8	0	46 59	47 58	48 58	49 57	50 56	51 56	52 55	53 55	0	0	1	2	3	4	5	6	7	8	9
	10	47 5	48 4	49 4	50 3	51 2	52 2	53 1	54 1	10	10	11	12	13	14	15	16	17	18	19
	20	47 11	48 10	49 9	50 9	51 8	52 8	53 7	54 6	20	20	21	22	23	24	25	26	27	28	29
	30	47 16	48 16	49 15	50 14	51 14	52 13	53 12	54 12	30	30	31	32	33	34	35	36	37	38	39
	40	47 22	48 21	49 20	50 20	51 19	52 18	53 17	54 17	40	40	41	42	43	44	45	45	46	47	48
	50	47 27	48 26	49 25	50 25	51 24	52 23	53 22	54 22	50	49	50	51	52	53	54	55	56	57	58
9	0	47 31	48 31	49 30	50 29	51 29	52 28	53 27	54 26	0	0	1	2	3	4	5	6	7	8	9
	10	47 36	48 35	49 35	50 34	51 33	52 32	53 31	54 31	10	10	11	12	13	14	15	16	17	18	19
	20	47 40	48 40	49 39	50 38	51 37	52 36	53 36	54 35	20	20	21	22	23	24	25	26	27	28	29
	30	47 45	48 44	49 43	50 42	51 41	52 40	53 40	54 39	30	30	31	32	33	34	35	36	36	37	38
	40	47 48	48 47	49 47	50 46	51 45	52 44	53 43	54 43	40	39	40	41	42	43	44	45	46	47	48
	50	47 52	48 51	49 50	50 50	51 49	52 48	53 47	54 46	50	49	50	51	52	53	54	55	56	57	58

Proportional parts to Minutes of Altitude—Add

☽ alt.		1′	2′	3′	4′	5′	6′	7′	8′	9′	☽ alt.		1′	2′	3′	4′	5′	6′	7′	8′	9′
3°	0′	3″	6″	9″	13″	16″	19″	22″	25″	28″	6°	0′	1″	2″	3″	4″	5″	7″	8″	9″	10″
	10	3	6	9	12	15	18	21	24	27		10	1	2	3	4	5	6	7	8	10
	20	2	5	8	11	14	17	19	22	25		20	1	2	3	4	5	6	7	8	9
	30	2	5	8	10	13	16	18	21	23		30	1	2	3	4	5	6	7	8	9
	40	2	5	7	10	12	15	17	19	22		40	1	2	3	4	5	5	6	7	8
	50	2	5	7	9	11	14	16	18	21		50	1	2	3	3	4	5	6	7	8
4	0	2	4	7	9	11	13	15	17	19	7	0	1	2	2	3	4	5	6	7	7
	10	2	4	6	8	10	12	14	16	18		10	1	2	2	3	4	5	5	6	7
	20	2	4	6	8	10	11	13	15	17		20	1	1	2	3	4	4	5	6	7
	30	2	4	5	7	9	11	13	14	16		30	1	1	2	3	3	4	5	6	6
	40	2	3	5	7	9	10	12	14	15		40	1	1	2	3	3	4	5	5	6
	50	2	3	5	6	8	10	11	13	14		50	1	1	2	3	3	4	5	5	6
5	0	2	3	5	6	8	9	11	12	14	8	0	1	1	2	2	3	3	4	5	5
	10	2	3	4	6	7	9	10	12	13	or	10	1	1	2	2	3	3	4	4	5
	20	1	3	4	5	7	8	10	11	12	9	20	0	1	1	2	2	3	3	4	4
	30	1	3	4	5	6	8	9	10	12		30	0	1	1	2	2	2	3	4	4
	40	1	2	4	5	6	7	9	10	11		40	0	1	1	2	2	2	3	3	4
	50	1	2	4	5	6	7	8	9	11		50	0	1	1	2	2	2	3	3	3

TABLE XXII.

CORRECTION OF THE MOON'S APPARENT ALTITUDE.

☽-App altit.		Horizontal Parallax.																Prop. parts for Seconds of Par.										
		54'		55'		56'		57'		58'		59'		60'		61'			0"	1"	2"	3"	4"	5"	6"	7"	8"	9"
°	'	'	"	'	"	'	"	'	"	'	"	'	"	'	"	'	"	"	"	"	"	"	"	"	"	"	"	"
10	0	47	56	48	55	49	54	50	53	51	52	52	51	53	50	54	49	0	0	1	2	3	4	5	6	7	8	9
	10	47	59	48	58	49	57	50	56	51	55	52	54	53	53	54	52	10	10	11	12	13	14	15	16	17	18	19
	20	48	2	49	1	50	0	50	59	51	58	52	57	53	56	54	56	20	20	21	22	23	24	25	26	27	28	29
	30	48	5	49	4	50	3	51	2	52	1	53	0	53	59	54	58	30	29	30	31	32	33	34	35	36	37	38
	40	48	8	49	7	50	6	51	5	52	4	53	3	54	2	55	1	40	39	40	41	42	43	44	45	46	47	48
	50	48	11	49	10	50	9	51	8	52	7	53	6	54	4	55	3	50	49	50	51	52	53	54	55	56	57	58
11	0	48	13	49	12	50	11	51	10	52	9	53	8	54	7	55	6	0	0	1	2	3	4	5	6	7	8	9
	10	48	16	49	15	50	14	51	12	52	11	53	10	54	9	55	8	10	10	11	12	13	14	15	16	17	18	19
	20	48	18	49	17	50	16	51	15	52	13	53	12	54	11	55	10	20	20	21	22	23	24	24	25	26	27	28
	30	48	20	49	19	50	18	51	17	52	15	53	14	54	13	55	12	30	29	30	31	32	33	34	35	36	37	38
	40	48	22	49	21	50	20	51	19	52	17	53	16	54	15	55	14	40	39	40	41	42	43	44	45	46	47	48
	50	48	24	49	23	50	22	51	20	52	19	53	18	54	16	55	15	50	49	50	51	52	53	54	55	56	57	58
12	0	48	26	49	25	50	23	51	22	52	21	53	19	54	18	55	17	0	0	1	2	3	4	5	6	7	8	9
	10	48	27	49	26	50	25	51	23	52	22	53	21	54	19	55	18	10	10	11	12	13	14	15	16	17	18	19
	20	48	29	49	28	50	26	51	25	52	23	53	22	54	21	55	19	20	20	21	21	22	23	24	25	26	27	28
	30	48	30	49	29	50	27	51	26	52	25	53	23	54	22	55	20	30	29	30	31	32	33	34	35	36	37	38
	40	48	32	49	30	50	29	51	27	52	26	53	24	54	23	55	21	40	39	40	41	42	43	44	45	46	47	48
	50	48	33	49	31	50	30	51	28	52	27	53	25	54	24	55	22	50	49	50	51	52	53	54	55	56	57	58
13	0	48	34	49	32	50	31	51	29	52	28	53	26	54	25	55	23	0	0	1	2	3	4	5	6	7	8	9
	10	48	35	49	33	50	32	51	30	52	28	53	27	54	25	55	24	10	10	11	12	13	14	15	16	17	18	18
	20	48	36	49	34	50	32	51	31	52	29	53	28	54	26	55	24	20	19	20	21	22	23	24	25	26	27	28
	30	48	36	49	35	50	33	51	31	52	30	53	28	54	26	55	25	30	29	30	31	32	33	34	35	36	37	38
	40	48	37	49	35	50	34	51	32	52	30	53	29	54	27	55	25	40	39	40	41	42	43	44	45	46	47	48
	50	48	38	49	36	50	34	51	32	52	31	53	29	54	27	55	25	50	49	50	51	52	53	53	54	55	56	57
14	0	48	38	49	36	50	35	51	33	52	31	53	29	54	27	55	26	0	0	1	2	3	4	5	6	7	8	9
	10	48	39	49	37	50	35	51	33	52	21	53	29	54	28	55	26	10	10	11	12	13	14	15	15	16	17	18
	20	48	39	49	37	50	35	51	33	52	31	53	30	54	28	55	26	20	19	20	21	22	23	24	25	26	27	28
	30	48	39	49	37	50	35	51	33	52	31	53	30	54	28	55	26	30	29	30	31	32	33	34	35	36	37	38
	40	48	39	49	37	50	35	51	33	52	31	53	30	54	28	55	26	40	39	40	41	42	43	44	45	46	46	47
	50	48	39	49	37	50	35	51	33	52	31	53	29	54	27	55	25	50	48	49	50	51	52	53	54	55	56	57
15	0	48	39	49	37	50	35	51	33	52	31	53	29	54	27	55	25	0	0	1	2	3	4	5	6	7	8	9
	10	48	39	49	37	50	35	51	33	52	31	53	29	54	27	55	25	10	10	11	12	13	14	14	15	16	17	18
	20	48	39	49	37	50	35	51	33	52	31	53	28	54	26	55	24	20	19	20	21	22	23	24	25	26	27	28
	30	48	39	49	37	50	34	51	32	52	30	53	28	54	26	55	24	30	29	30	31	32	33	34	35	36	37	38
	40	48	39	49	36	50	34	51	32	52	30	53	27	54	25	55	23	40	39	39	40	41	42	43	44	45	46	47
	50	48	38	49	36	50	34	51	31	52	29	53	27	54	24	55	22	50	48	49	50	51	52	53	54	55	56	57
16	0	48	38	49	35	50	33	51	31	52	28	53	26	54	24	55	21	0	0	1	2	3	4	5	6	7	8	9
	10	48	37	49	35	50	32	51	30	52	28	53	25	54	23	55	21	10	10	11	12	13	14	15	15	16	17	18
	20	48	37	49	34	50	32	51	29	52	27	53	25	54	22	55	20	20	19	20	21	22	23	24	25	26	27	28
	30	48	36	49	33	50	31	51	29	52	26	53	24	54	21	55	19	30	29	30	31	32	33	34	35	36	37	38
	40	48	35	49	33	50	30	51	28	52	25	53	23	54	20	55	18	40	39	39	40	41	42	43	44	45	46	47
	50	48	34	49	32	50	29	51	27	52	24	53	22	54	19	55	16	50	48	49	50	51	52	53	54	55	56	57
17	0	48	34	49	31	50	28	51	26	52	23	53	21	54	18	55	15	0	0	1	2	3	4	5	6	7	8	9
	10	48	33	49	30	50	27	51	25	52	22	53	19	54	17	55	14	10	10	10	11	12	13	14	15	16	17	18
	20	48	32	49	29	50	26	51	24	52	21	53	18	54	15	55	13	20	19	20	21	22	23	24	25	26	27	28
	30	48	31	49	28	50	25	51	22	52	20	53	17	54	14	55	11	30	29	30	30	31	32	33	34	35	36	37
	40	48	30	49	27	50	24	51	21	52	18	53	16	54	13	55	10	40	38	39	40	41	42	43	44	45	46	47
	50	48	29	49	26	50	23	51	20	52	17	53	14	54	11	55	8	50	48	49	50	51	52	52	53	54	55	56
18	0	48	27	49	24	50	22	51	19	52	16	53	13	54	10	55	7	0	0	1	2	3	4	5	6	7	8	9
	10	48	26	49	23	50	20	51	17	52	14	53	11	54	8	55	5	10	9	10	11	12	13	14	15	16	17	18
	20	48	25	49	22	50	19	51	16	52	13	53	10	54	7	55	4	20	19	20	21	22	23	24	25	26	27	27
	30	48	23	49	20	50	17	51	14	52	11	53	8	54	5	55	2	30	28	29	30	31	32	33	34	35	36	37
	40	48	22	49	19	50	16	51	13	52	9	53	6	54	3	55	0	40	38	39	40	41	42	43	44	45	46	46
	50	48	21	49	17	50	14	51	11	52	8	53	5	54	1	54	58	50	47	48	49	50	51	52	53	54	55	56
19	0	48	19	49	16	50	13	51	9	52	6	53	3	54	0	54	56	0	0	1	2	3	4	5	6	7	8	8
	10	48	18	49	14	50	11	51	8	52	4	53	1	53	58	54	54	10	9	10	11	12	13	14	15	16	17	18
	20	48	16	49	13	50	9	51	6	52	2	52	59	53	56	54	52	20	19	20	21	22	23	24	24	25	26	27
	30	48	14	49	11	50	7	51	4	52	1	52	57	53	54	54	50	30	28	29	30	31	32	33	34	35	36	37
	40	48	13	49	9	50	6	51	2	51	59	52	55	53	52	54	48	40	38	39	40	41	41	42	43	44	45	46
	50	48	11	49	7	50	4	51	0	51	57	52	53	53	49	54	46	50	47	48	49	50	51	52	53	54	55	56

P. parts to min. of alt.	1'	2'	3'	4'	5'	6'	7'	8'	9'	Add	P. parts to min. of alt.	1'	2'	3'	4'	5'	6'	7'	8'	9'	Sub.
	0"	0"	0"	0"	1"	1"	1"	1"	1"			0"	0"	0"	0"	1"	1"	1"	1"	1"	

TABLE XXII.

CORRECTION OF THE MOON'S APPARENT ALTITUDE.

☽ App altit.		Horizontal Parallax.																Prop. parts for Seconds of Par.										
		54′		55′		56′		57′		58′		59′		60′		61′			0″	1″	2″	3	4″	5″	6″	7″	8″	9″
°	′	′	″	′	″	′	″	′	″	′	″	′	″	′	″	′	″	″	″	″	″	″	″	″	″	″	″	″
20	0	48	9	49	5	50	2	50	58	51	55	52	51	53	47	54	44	0	0	1	2	3	4	5	6	7	8	8
	10	48	7	49	3	50	0	50	56	51	52	52	49	53	45	54	41	10	9	10	11	12	13	14	15	16	17	18
	20	48	5	49	1	49	58	50	54	51	50	52	46	53	43	54	39	20	19	20	21	22	22	23	24	25	26	27
	30	48	3	48	59	49	56	50	52	51	48	52	44	53	40	54	37	30	28	29	30	31	32	33	34	35	36	37
	40	48	1	48	57	49	53	50	50	51	46	52	42	53	38	54	34	40	37	38	39	40	41	42	43	44	45	46
	50	47	59	48	55	49	51	50	47	51	44	52	40	53	36	54	32	50	47	48	49	50	51	51	52	53	54	55
21	0	47	57	48	53	49	49	50	45	51	41	52	37	53	33	54	29	0	0	1	2	3	4	5	6	7	7	8
	10	47	55	48	51	49	47	50	43	51	39	52	35	53	31	54	27	10	9	10	11	12	13	14	15	16	17	18
	20	47	53	48	49	49	45	50	40	51	36	52	32	53	28	54	24	20	19	20	21	21	22	23	24	25	26	27
	30	47	51	48	46	49	42	50	38	51	34	52	30	53	26	54	21	30	28	29	30	31	31	32	33	34	35	36
	40	47	48	48	44	49	40	50	36	51	31	52	27	53	23	54	19	40	37	38	39	40	41	42	43	44	45	46
	50	47	46	48	42	49	37	50	33	51	29	52	25	53	20	54	16	50	47	47	48	49	50	51	52	53	54	55
22	0	47	44	48	39	49	35	50	31	51	26	52	22	53	18	54	13	0	0	1	2	3	4	5	6	6	7	8
	10	47	41	48	37	49	32	50	28	51	24	52	19	53	15	54	10	10	9	10	11	12	13	14	15	16	17	18
	20	47	39	48	34	49	30	50	25	51	21	52	16	53	12	54	7	20	18	19	20	21	22	23	24	25	26	27
	30	47	36	48	32	49	27	50	23	51	18	52	14	53	9	54	4	30	28	29	30	30	31	32	33	34	35	36
	40	47	34	48	29	49	25	50	20	51	15	52	11	53	6	54	1	40	37	38	39	40	41	42	43	43	44	45
	50	47	31	48	27	49	22	50	17	51	13	52	8	53	3	53	58	50	46	47	48	49	50	51	52	53	54	55
23	0	47	29	48	24	49	19	50	14	51	10	52	5	53	0	53	55	0	0	1	2	3	4	5	6	6	7	8
	10	47	26	48	21	49	16	50	12	51	7	52	2	52	57	53	52	10	9	10	11	12	13	14	15	16	17	17
	20	47	23	48	19	49	14	50	9	51	4	51	59	52	54	53	49	20	18	19	20	21	22	23	24	25	26	27
	30	47	21	48	16	49	11	50	6	51	1	51	56	52	51	53	46	30	28	28	29	30	31	32	33	34	35	36
	40	47	18	48	13	49	8	50	3	50	58	51	53	52	48	53	43	40	37	38	39	39	40	41	42	43	44	45
	50	47	15	48	10	49	5	50	0	50	55	51	50	52	44	53	39	50	46	47	48	49	50	50	51	52	53	54
24	0	47	12	48	7	49	2	49	57	50	52	51	47	52	41	53	36	0	0	1	2	3	4	5	5	6	7	8
	10	47	10	48	4	48	59	49	54	50	48	51	43	52	38	53	33	10	9	10	11	12	13	14	15	15	16	17
	20	47	7	48	1	48	56	49	51	50	45	51	40	52	35	53	29	20	18	19	20	21	22	23	24	25	25	26
	30	47	4	47	58	48	53	49	47	50	42	51	37	52	31	53	26	30	27	28	29	30	31	32	33	34	35	35
	40	47	1	47	55	48	50	49	44	50	39	51	33	52	28	53	22	40	36	37	38	39	40	41	42	43	44	45
	50	46	58	47	52	48	47	49	41	50	35	51	30	52	24	53	19	50	46	46	47	48	49	50	51	52	53	54
25	0	46	55	47	49	48	43	49	38	50	32	51	27	52	21	53	15	0	0	1	2	3	4	5	5	6	7	8
	10	46	52	47	46	48	40	49	34	50	29	51	23	52	17	53	12	10	9	10	11	12	13	14	14	15	16	17
	20	46	48	47	43	48	37	49	31	50	25	51	26	52	14	53	8	20	18	19	20	21	22	23	23	24	25	26
	30	46	45	47	39	48	34	49	28	50	22	51	16	52	10	53	4	30	27	28	29	30	31	32	32	33	34	35
	40	46	42	47	36	48	30	49	24	50	18	51	13	52	7	53	1	40	36	37	38	39	40	41	41	42	43	44
	50	46	39	47	33	48	27	49	21	50	15	51	9	52	3	52	57	50	45	46	47	48	49	50	51	51	52	53
26	0	46	36	47	30	48	23	49	17	50	11	51	5	51	59	52	53	0	0	1	2	3	4	4	5	6	7	8
	10	46	32	47	26	48	20	49	14	50	8	51	2	51	55	52	49	10	9	10	11	12	13	13	14	15	16	17
	20	46	29	47	23	48	17	49	10	50	4	50	58	51	52	52	45	20	18	19	20	21	21	22	23	24	25	26
	30	46	26	47	19	48	13	49	7	50	0	50	54	51	48	52	41	30	27	28	29	30	30	31	32	33	34	35
	40	46	22	47	16	48	9	49	3	49	57	50	50	51	44	52	38	40	36	37	38	39	40	40	41	42	43	44
	50	46	19	47	12	48	6	48	59	49	53	50	46	51	40	52	34	50	45	46	47	47	48	49	50	51	52	53
27	0	46	15	47	9	48	2	48	56	49	49	50	43	51	36	52	30	0	0	1	2	3	4	4	5	6	7	8
	10	46	12	47	5	47	59	48	52	49	45	50	39	51	32	52	36	10	9	10	11	12	12	13	14	15	16	17
	20	46	8	47	2	47	55	48	48	49	42	50	35	51	28	52	21	20	18	19	20	20	21	22	23	24	25	26
	30	46	5	46	58	47	51	48	44	49	39	50	31	51	24	52	17	30	27	27	28	29	30	31	32	33	34	35
	40	46	1	46	54	47	47	48	40	49	34	50	27	51	20	52	13	40	35	36	37	38	39	40	41	42	43	43
	50	45	58	46	51	47	44	48	37	49	30	50	23	51	16	52	9	50	44	45	46	47	48	49	50	51	51	52
28	0	45	54	46	47	47	40	48	33	49	26	50	19	51	12	52	5	0	0	1	2	3	4	4	5	6	7	8
	10	45	50	46	43	47	36	48	29	49	22	50	15	51	8	52	0	10	9	10	11	11	12	13	14	15	16	17
	20	45	46	46	39	47	32	48	25	49	17	50	10	51	4	51	56	20	18	18	19	20	21	22	23	24	25	25
	30	45	43	46	35	47	28	48	21	49	14	50	6	50	59	51	52	30	26	27	28	29	30	31	32	32	33	34
	40	45	39	46	32	47	24	48	17	49	9	50	2	50	55	51	47	40	35	36	37	38	39	40	40	41	42	43
	50	45	35	46	28	47	20	48	13	49	5	49	58	50	50	51	43	50	44	45	46	47	47	48	49	50	51	52
29	0	45	31	46	24	47	16	48	9	49	1	49	54	50	46	51	39	0	0	1	2	3	3	4	5	6	7	8
	10	45	27	46	20	47	12	48	5	48	57	49	49	50	42	51	34	10	9	10	10	11	12	13	14	15	16	17
	20	45	23	46	16	47	8	48	0	48	53	49	45	50	37	51	30	20	17	18	19	20	21	22	23	23	24	25
	30	45	19	46	12	47	4	47	56	48	48	49	41	50	33	51	25	30	26	27	28	29	30	30	31	32	33	34
	40	45	15	46	8	47	0	47	52	48	44	49	36	50	28	51	20	40	35	36	37	37	38	39	40	41	42	43
	50	45	12	46	4	46	56	47	48	48	40	49	32	50	42	51	16	50	44	44	45	46	47	48	49	50	50	51

Prop. parts to min. of altit.	1′	2′	3′	4′	5′	6′	7′	8′	9′	Sub.
	0″	1″	1″	1″	2″	2″	2″	3″	3″	

TABLE XXII.

CORRECTION OF THE MOON'S APPARENT ALTITUDE.

☽ Ap altit.		Horizontal Parallax.																Prop. parts for Seconds for Par.										
		54′		55′		56′		57′		58′		59′		60′		61′			0″	1″	2″	3″	4″	5″	6″	7″	8″	9″
°	′	′	″	′	″	′	″	′	″	′	″	′	″	′	″	′	″	″	″	″	″	″	″	″	″	″	″	″
30	0	45	7	45	59	46	51	47	43	48	35	49	27	50	19	51	11	0	0	1	2	3	3	4	5	6	7	8
	10	45	3	45	55	46	47	47	39	48	31	49	23	50	15	51	7	10	9	9	10	11	12	13	14	15	16	16
	20	44	59	45	51	46	43	47	35	48	26	49	18	50	10	51	2	20	17	18	19	20	21	22	22	23	24	25
	30	44	55	45	47	46	39	47	30	48	22	49	14	50	5	50	57	30	26	27	28	28	29	30	31	32	33	34
	40	44	51	45	43	46	34	47	26	48	17	49	9	50	1	50	52	40	34	35	36	37	38	39	40	41	41	42
	50	44	47	45	38	46	30	47	21	48	13	49	4	49	56	50	47	50	43	44	45	46	47	47	48	49	50	51
31	0	44	43	45	34	46	25	47	17	48	8	49	0	49	51	50	43	0	0	1	2	3	3	4	5	6	7	8
	10	44	38	45	30	46	21	47	12	48	4	48	55	49	46	50	38	10	9	9	10	11	12	13	14	15	15	16
	20	44	31	45	25	46	17	47	8	47	59	48	50	49	42	50	33	20	17	18	19	20	20	21	22	23	24	25
	30	44	30	45	21	46	12	47	3	47	54	48	46	49	37	50	28	30	26	26	27	28	29	30	31	32	32	33
	40	44	25	45	16	46	8	46	59	47	50	48	41	49	32	50	23	40	34	35	36	37	38	38	39	40	41	42
	50	44	21	45	12	46	3	46	54	47	45	48	36	49	27	50	18	50	43	44	44	45	46	47	48	49	49	50
32	0	44	17	45	8	45	58	46	49	47	40	48	31	49	22	50	13	0	0	1	2	3	3	4	5	6	7	8
	10	44	12	45	3	45	54	46	45	47	35	48	26	49	17	50	8	10	8	9	10	11	12	13	13	14	15	16
	20	44	8	44	58	45	49	46	40	47	31	48	21	49	12	50	3	20	17	18	19	19	20	21	22	23	24	24
	30	44	3	44	54	45	45	46	35	47	26	48	16	49	7	49	58	30	25	26	27	28	28	29	30	31	32	33
	40	43	59	44	49	45	40	46	30	47	21	48	11	49	2	49	52	40	33	34	35	36	37	38	38	39	40	41
	50	43	54	44	45	45	35	46	26	47	16	48	6	48	57	49	47	50	42	43	44	45	46	47	47	48	49	50
33	0	43	50	44	40	45	30	46	21	47	11	48	1	48	52	49	42	0	0	1	2	3	3	4	5	6	7	8
	10	43	45	44	35	45	26	46	16	47	6	47	56	48	46	49	37	10	8	1	10	11	12	13	13	14	15	16
	20	43	40	44	31	45	21	46	11	47	1	47	51	48	41	49	31	20	17	18	18	19	20	21	22	23	23	24
	30	43	36	44	26	45	16	46	6	46	56	47	46	48	36	49	26	30	25	26	27	28	28	29	30	31	32	35
	40	43	31	44	21	45	11	46	1	46	51	47	41	48	31	49	21	40	33	34	35	36	37	38	38	39	40	41
	50	43	26	44	16	45	6	45	56	46	46	47	36	48	26	49	15	50	42	43	43	44	45	46	47	48	48	49
34	0	43	22	44	12	45	51	45	51	46	41	47	30	48	20	49	10	0	0	1	2	2	3	4	5	6	7	7
	10	43	17	44	7	44	56	45	46	46	36	47	25	48	15	49	5	10	8	9	10	11	12	12	13	14	15	16
	20	43	12	44	2	44	51	45	41	46	30	47	20	48	9	48	59	20	16	17	18	19	20	21	21	22	23	24
	30	43	7	43	57	44	46	45	36	46	25	47	15	48	4	48	54	30	25	26	26	27	28	29	30	30	31	32
	40	43	2	43	52	44	41	45	31	46	20	47	9	47	59	48	48	40	33	34	35	35	36	37	38	39	40	40
	50	42	58	43	47	44	36	45	25	46	15	47	4	47	53	48	42	50	41	42	43	44	44	45	46	47	48	49
35	0	42	53	43	42	44	31	45	20	46	9	46	59	47	48	48	37	0	0	1	2	2	3	4	5	6	7	7
	10	42	48	43	37	44	26	45	15	46	4	46	53	47	42	48	31	10	8	9	10	11	11	12	13	14	15	15
	20	42	43	43	32	44	21	45	10	45	59	46	48	47	37	48	26	20	16	17	18	19	20	20	21	22	23	24
	30	42	38	43	27	44	16	45	5	45	53	46	42	47	31	48	20	30	24	25	26	27	28	28	29	30	31	32
	40	42	33	43	22	44	10	44	59	45	48	46	37	47	24	48	14	40	33	33	34	35	36	37	37	38	39	40
	50	42	28	43	17	44	5	44	54	45	43	46	31	47	20	48	8	50	41	42	42	43	44	45	46	47	47	48
36	0	42	23	43	11	44	0	44	49	45	37	46	26	47	14	48	3	0	0	1	2	2	3	4	5	6	6	7
	10	42	18	43	6	43	55	44	43	45	32	46	20	47	8	47	57	10	8	9	10	10	11	12	13	14	14	15
	20	42	13	43	1	43	49	44	38	45	26	46	14	47	3	47	51	20	16	17	18	18	19	20	21	22	23	23
	30	42	8	42	56	43	44	44	32	45	21	46	9	46	57	47	45	30	24	25	26	27	27	28	29	30	31	32
	40	42	2	42	51	43	39	44	27	45	15	46	3	46	51	47	39	40	32	33	34	35	35	36	37	38	39	39
	50	41	57	42	45	43	33	44	21	45	9	45	57	46	45	47	33	50	40	41	42	43	43	44	45	46	47	47
37	0	41	52	42	40	43	28	44	16	45	3	45	52	46	40	47	28	0	0	1	2	2	3	4	5	6	6	7
	10	41	47	42	35	43	22	44	10	44	58	45	46	46	34	47	22	10	8	9	10	10	11	12	13	13	14	15
	20	41	42	42	29	43	17	44	5	44	52	45	40	46	28	47	16	20	16	17	17	18	19	20	21	21	22	23
	30	41	36	42	24	43	11	43	59	44	47	45	34	46	22	47	9	30	24	25	25	26	27	28	29	29	30	31
	40	41	31	42	18	43	6	43	53	44	41	45	28	46	16	47	3	40	32	33	33	34	35	36	36	37	38	39
	50	41	26	42	13	43	0	43	48	44	35	45	23	46	10	46	57	50	40	40	41	42	43	44	44	45	46	47
38	0	41	20	42	8	42	55	43	42	44	29	45	17	46	4	46	51	0	0	1	2	2	3	4	5	5	6	7
	10	41	15	42	2	42	49	43	36	44	24	45	11	45	58	46	45	10	8	9	9	10	11	12	12	13	14	15
	20	41	10	41	57	42	44	43	31	44	18	45	5	45	52	46	39	20	16	16	17	18	19	20	20	21	22	23
	30	41	4	41	51	42	38	43	25	44	12	44	59	45	46	46	33	30	23	24	25	26	27	27	28	29	30	31
	40	40	59	41	45	42	32	43	19	44	6	44	53	45	40	46	27	40	31	32	33	34	34	35	36	37	38	38
	50	40	53	41	40	42	27	43	13	44	0	44	47	45	34	46	20	50	39	40	41	41	42	43	44	45	45	46
39	0	40	46	41	34	42	21	43	8	43	54	44	41	45	27	46	14	0	0	1	2	2	3	4	5	5	6	7
	10	40	41	41	29	42	15	43	2	43	48	44	35	45	21	46	8	10	8	9	9	10	11	12	12	13	14	15
	20	40	37	41	23	42	9	42	56	43	42	44	29	45	15	46	1	20	15	16	17	18	19	19	20	21	22	23
	30	40	31	41	17	42	4	42	50	43	36	44	22	45	9	45	55	30	23	24	25	25	26	27	28	29	29	30
	40	40	25	41	12	41	58	42	44	43	30	44	16	45	3	45	49	40	31	32	32	33	34	35	36	36	37	38
	50	40	20	41	6	41	52	42	38	43	24	44	10	44	56	45	42	50	39	39	40	41	42	42	43	44	45	46

Prop. parts to min. of altit.	1′	1′	3′	4′	5′	6′	7′	8′	9′	Sub.
	1″	1″	2″	2′	3″	3″	4″	4″	5″	

TABLE XXII.

CORRECTION OF THE MOON'S APPARENT ALTITUDE

☽ App altit.		Horizontal Parallax.																Prop. parts for Second						
		54"		35"		56"		57"		58"		59"		60"		61"			0"	1"	2"	3"	4"	5"	6"
°	'	'	"	'	"	'	"	'	"	'	"	'	"	'	"	'	"	"	"	"	"	"	"	"	"
40	0	40	14	41	0	41	46	42	32	43	18	44	4	44	50	45	36	0	0	1	1	2	3	4	5
	10	40	8	40	54	41	40	42	26	43	12	43	58	44	44	45	29	10	8	8	9	10	11	11	12
	20	40	3	40	49	41	34	42	20	43	6	43	51	44	37	45	22	20	15	16	17	17	18	19	20
	30	39	57	40	43	41	28	42	14	43	0	43	45	44	31	45	16	30	23	24	24	25	26	27	27
	40	39	51	40	37	41	22	42	8	42	53	43	39	44	24	45	10	40	30	31	32	33	33	34	35
	50	39	46	40	31	41	16	42	2	42	47	43	33	44	18	45	3	50	38	39	40	40	41	42	43
41	0	39	40	40	25	41	10	41	56	42	41	43	26	44	11	44	57	0	0	1	1	2	3	4	4
	10	39	34	40	19	41	4	41	49	42	35	43	20	44	5	44	50	10	7	8	9	10	10	11	12
	20	39	28	40	13	40	58	41	43	42	28	43	13	43	58	44	43	20	15	16	16	17	18	19	19
	30	39	22	40	7	40	52	41	37	42	22	43	7	43	52	44	37	30	22	23	24	25	25	26	27
	49	39	16	40	1	40	46	41	31	42	16	43	1	43	45	44	30	40	30	31	31	32	33	34	34
	50	39	10	39	55	40	40	41	25	42	9	42	54	43	39	44	23	50	37	38	39	40	40	41	42
42	0	39	5	39	49	40	34	41	18	42	3	42	47	43	32	44	17	0	0	1	1	2	3	4	4
	10	38	59	39	43	40	28	41	12	41	57	42	41	43	25	44	10	10	7	8	9	10	10	11	12
	20	38	53	39	37	40	21	41	6	41	50	42	34	43	19	44	3	20	15	15	16	17	18	18	19
	30	38	47	39	31	40	15	40	59	41	44	42	28	43	12	43	56	30	22	23	24	24	25	26	27
	40	38	41	39	25	40	9	40	53	41	37	42	21	43	5	43	49	40	29	30	31	32	32	33	34
	50	38	35	39	19	40	3	40	47	41	31	42	15	42	59	43	43	50	37	38	38	39	40	41	41
43	0	38	29	39	12	39	56	40	40	41	24	42	8	42	52	43	36	0	0	1	1	2	3	4	4
	10	38	22	39	6	39	50	40	34	41	18	42	1	42	45	43	29	10	7	8	9	9	10	11	12
	20	38	16	39	0	39	44	40	27	41	11	41	55	42	38	43	22	20	15	15	16	17	17	18	19
	30	38	10	38	54	39	37	40	21	41	4	41	48	42	31	43	15	30	22	22	23	24	25	25	26
	40	38	4	38	47	39	31	40	14	40	58	41	41	42	24	43	8	40	29	30	30	31	32	33	33
	50	37	58	38	41	39	24	40	8	40	51	41	34	42	18	43	1	50	36	37	38	38	39	40	41
44	0	37	52	38	35	39	18	40	1	40	44	41	28	42	11	42	54	0	0	1	1	2	3	4	4
	10	37	46	38	29	39	12	39	55	40	38	41	21	42	4	42	47	10	7	8	9	9	0	11	11
	20	37	39	38	22	39	5	39	48	40	31	41	14	41	57	42	40	20	14	15	16	16	17	18	19
	30	37	33	38	16	38	59	39	41	40	24	41	7	41	50	42	33	30	21	22	23	24	24	25	26
	40	37	27	38	9	38	52	39	35	40	17	41	0	41	43	42	25	40	29	29	30	31	31	32	33
	50	37	20	38	3	38	46	39	28	40	11	40	53	41	36	42	18	50	36	36	37	38	39	39	40
45	0	37	14	37	57	38	39	39	21	40	4	40	46	41	29	42	11	0	0	1	1	2	3	4	4
	10	37	8	37	50	38	32	39	15	39	57	40	39	41	22	42	4	10	7	8	8	9	10	11	11
	20	37	1	37	43	38	26	39	8	39	50	40	32	41	14	41	57	20	14	15	15	16	17	18	18
	30	36	55	37	37	38	19	39	1	39	43	40	25	41	7	41	49	30	21	22	22	23	24	25	25
	40	36	49	37	31	38	12	38	54	39	36	40	18	41	6	41	42	40	28	29	29	30	31	32	32
	50	36	42	37	24	38	8	38	48	39	29	40	11	40	53	41	35	50	35	36	36	37	38	39	39
46	0	36	36	37	17	37	59	38	41	39	22	40	4	40	46	41	27	0	0	1	1	2	3	4	4
	10	36	29	37	11	37	52	38	34	39	15	49	57	40	39	41	20	10	7	8	8	9	10	10	11
	20	36	23	37	4	37	46	38	27	39	8	39	50	40	31	41	13	20	14	14	15	16	17	17	18
	30	56	16	36	58	37	39	38	20	39	1	39	43	40	24	41	5	30	21	21	22	23	23	24	25
	40	36	10	36	51	37	32	38	13	38	54	39	36	40	17	40	58	40	28	28	29	30	30	31	32
	50	36	3	36	44	37	25	38	6	38	47	39	28	40	9	40	50	50	34	35	36	36	37	38	39
47	0	35	57	36	38	37	18	37	59	38	40	39	21	40	2	40	43	0	0	1	1	2	3	3	4
	10	35	50	36	31	37	12	37	52	38	33	39	14	39	55	40	36	10	7	7	8	9	9	10	11
	20	35	43	36	24	37	5	37	45	38	26	39	7	39	47	40	28	20	14	14	15	16	16	17	18
	30	35	37	36	17	36	58	37	38	38	19	38	59	39	40	40	22	30	20	21	22	22	23	24	24
	40	35	30	36	10	36	51	37	31	38	12	38	52	39	32	40	13	40	27	28	28	29	30	30	31
	50	35	23	36	3	36	44	37	24	38	5	38	45	39	25	40	5	50	34	34	35	36	37	37	38
48	0	35	17	35	57	36	37	37	17	37	57	38	37	39	18	39	58	0	0	1	1	2	3	3	4
	10	35	10	35	50	36	30	37	10	37	50	38	30	39	10	39	50	10	7	7	8	9	9	10	11
	20	35	3	35	43	36	23	37	3	37	43	38	23	39	3	39	42	20	13	14	15	15	16	17	17
	30	34	56	35	36	36	16	36	56	37	36	38	15	38	55	39	35	30	20	21	21	22	23	23	24
	40	34	50	35	29	36	9	36	49	37	28	38	8	38	47	39	27	40	27	27	28	29	29	30	30
	50	34	43	35	22	36	2	36	41	37	21	38	0	38	40	39	19	50	33	34	34	35	36	36	37
49	0	34	36	35	15	35	55	36	34	37	14	37	53	38	32	39	12	0	0	1	1	2	3	3	4
	10	34	29	35	9	35	48	36	27	37	6	37	45	38	25	39	4	10	6	7	8	8	9	10	10
	20	34	22	35	2	35	41	36	20	36	59	37	38	38	17	38	56	20	13	14	14	15	16	16	17
	30	34	16	34	55	35	34	36	12	36	51	37	30	38	9	38	48	30	19	20	21	21	22	23	23
	40	34	9	34	48	35	26	36	5	36	44	37	23	38	2	38	41	40	26	27	27	28	29	29	30
	50	34	2	34	39	35	19	35	58	36	37	37	15	37	54	38	33	50	32	33	34	34	35	36	36

Prop. parts to min. of altit.	1'	2'	3'	4'	5'	6'	7'	8'	9'	Sub.
	1"	1"	2"	3"	3"	4"	5"	5"	6"	

TABLE XXII.

CORRECTION OF THE MOON'S APPARENT ALTITUDE.

☽ Ap altit.		Horizontal Parallax.																Prop. parts for Seconds for Par.										
		54'		55'		56'		57'		58'		59'		60'		61'			0"	1"	2"	3"	4"	5"	6"	7"	8"	9"
°	'	'	"	'	"	'	"	'	"	'	"	'	"	'	"	'	"	"	"	"	"	"	"	"	"	"	"	"
50	0	33	55	34	33	35	12	35	51	36	29	37	8	37	46	38	25	0	0	1	1	2	3	3	4	4	5	6
	10	33	48	34	26	35	5	35	43	36	22	37	0	37	39	38	17	10	6	7	7	8	9	10	10	11	11	12
	20	33	41	34	19	34	58	35	36	36	14	36	52	37	31	38	9	20	13	13	14	15	15	16	17	17	18	18
	30	33	34	34	12	34	50	35	28	36	7	36	45	37	23	38	1	30	19	20	20	21	22	22	23	24	24	25
	40	33	27	34	5	34	43	35	21	35	59	36	37	37	15	37	53	40	25	26	27	27	28	29	29	30	31	31
	50	33	20	33	58	34	36	35	14	35	52	36	29	37	7	37	45	50	32	32	33	34	34	35	36	36	37	38
51	0	33	13	33	51	34	28	35	6	35	44	36	22	36	59	37	37	0	0	1	1	2	2	3	4	4	5	6
	10	33	6	33	43	34	21	34	59	35	36	36	14	36	52	37	29	10	6	7	7	8	9	9	10	11	11	12
	20	32	59	33	36	34	14	34	51	35	29	36	6	36	44	37	21	20	12	13	14	14	15	16	16	17	17	18
	30	32	52	33	29	34	6	34	44	35	21	35	58	36	36	37	13	30	19	19	20	21	21	22	22	23	24	24
	40	32	45	33	22	33	59	34	36	35	13	35	50	36	28	37	5	40	25	26	26	27	28	29	29	30	30	31
	50	32	37	33	14	33	52	34	29	35	6	35	42	36	20	36	57	50	31	32	32	33	34	34	35	35	36	37
52	0	32	30	33	7	33	44	34	21	34	58	35	35	36	12	36	49	0	0	1	1	2	2	3	4	4	5	5
	10	32	23	33	0	33	37	34	13	34	50	35	27	36	4	36	41	10	6	7	7	8	9	9	10	10	11	12
	20	32	16	32	53	33	29	34	6	34	43	35	19	35	56	36	33	20	12	13	13	14	15	15	16	16	17	18
	30	32	9	32	45	33	22	33	58	34	35	35	11	35	48	36	24	30	18	19	19	20	21	21	22	23	23	24
	40	32	1	32	38	33	14	33	51	34	27	35	3	35	40	36	16	40	24	25	26	26	27	27	28	29	29	30
	50	31	54	32	30	33	7	33	43	34	19	34	55	35	32	36	8	50	30	31	32	32	33	33	34	35	35	36
53	0	31	47	32	23	32	59	33	35	34	11	34	48	35	24	36	0	0	0	1	1	2	2	3	4	4	5	5
	10	31	40	32	16	32	52	33	28	34	4	34	40	35	15	35	51	10	6	6	7	8	8	9	10	10	11	11
	20	31	32	32	8	32	44	33	20	33	56	34	32	35	7	35	43	20	12	12	13	14	14	15	15	16	17	17
	30	31	25	32	1	32	36	33	12	33	48	34	24	34	59	35	35	30	18	18	19	20	20	21	21	22	23	23
	40	31	18	31	53	32	29	33	4	33	40	34	15	34	51	35	27	40	24	24	25	26	26	27	27	28	29	29
	50	31	10	31	46	32	21	32	57	33	32	34	7	34	43	35	18	50	30	30	31	32	32	33	33	34	35	35
54	0	31	3	31	38	32	13	32	49	33	24	33	59	34	35	35	10	0	0	1	1	2	2	3	3	4	5	5
	10	30	56	31	31	32	6	32	41	33	16	33	51	34	26	35	2	10	6	6	7	8	8	9	9	10	10	11
	20	30	48	31	23	31	58	32	33	33	8	33	43	34	18	34	53	20	12	12	13	13	14	15	15	16	16	17
	30	30	41	31	16	31	51	32	25	33	0	33	35	34	10	34	45	30	17	18	19	19	20	20	21	21	22	23
	40	30	33	31	8	31	43	32	18	32	52	33	27	34	2	34	36	40	23	24	24	25	26	26	27	27	28	28
	50	30	26	31	1	31	35	32	10	32	44	33	19	33	53	34	28	50	29	30	30	31	31	32	32	33	34	34
55	0	30	19	30	53	31	27	32	2	32	36	33	11	33	45	34	19	0	0	1	1	2	2	3	3	4	5	5
	10	30	11	30	45	31	20	31	54	32	28	33	2	33	37	34	11	10	6	6	7	7	8	8	9	10	10	11
	20	30	4	30	38	31	12	31	46	32	20	32	54	33	28	34	2	20	11	12	12	13	14	14	15	15	16	16
	30	29	56	30	30	31	4	31	38	32	12	32	46	33	20	33	54	30	17	18	18	19	19	20	20	21	22	22
	40	29	48	30	22	30	56	31	30	32	4	32	38	33	12	33	45	40	23	23	24	24	25	25	26	27	27	28
	50	29	41	30	15	30	47	31	22	31	56	32	29	33	3	33	37	50	28	29	29	30	31	31	32	32	33	33
56	0	29	33	30	7	30	40	31	14	31	48	32	21	32	55	33	28	0	0	1	1	2	2	3	3	4	4	5
	10	29	26	29	59	30	33	31	6	31	39	32	13	32	46	33	20	10	6	6	7	7	8	8	9	9	10	10
	20	29	18	29	51	30	25	30	58	31	31	32	4	32	38	33	11	20	11	12	12	13	13	14	14	15	15	16
	30	29	11	29	44	30	17	30	50	31	23	31	56	32	29	33	2	30	17	17	18	18	19	19	20	20	21	22
	40	29	3	29	36	30	9	30	42	31	15	31	48	32	21	32	54	40	22	23	23	24	24	25	25	26	26	27
	50	28	55	29	28	30	1	30	34	31	7	31	39	32	12	32	45	50	28	28	29	29	30	30	31	31	32	33
57	0	28	48	29	20	29	53	30	26	30	58	31	31	32	4	32	36	0	0	1	1	2	2	3	3	4	4	5
	10	28	40	29	12	29	45	30	18	30	50	31	23	31	55	32	28	10	5	6	6	7	8	8	9	9	10	10
	20	28	32	29	5	29	37	30	9	30	42	31	14	31	47	32	19	20	11	11	12	12	13	13	14	14	15	16
	30	28	25	28	57	29	29	30	1	30	34	31	6	31	38	32	10	30	16	17	17	18	18	19	19	20	20	21
	40	28	17	28	49	29	21	29	53	30	25	30	57	31	29	32	1	40	21	22	23	23	24	24	25	25	26	26
	50	28	9	28	41	29	13	29	45	30	17	30	49	31	21	31	53	50	27	27	28	28	29	30	30	31	31	32
58	0	28	1	28	33	29	5	29	37	30	9	30	40	31	12	31	44	0	0	1	1	2	2	3	3	4	4	5
	10	27	54	28	25	28	57	29	29	30	0	30	32	31	3	31	35	10	5	6	6	7	7	8	8	9	9	10
	20	27	46	28	17	28	49	29	20	29	52	30	23	30	55	31	26	20	10	11	11	12	13	13	14	14	15	15
	30	27	38	28	9	28	41	29	12	29	43	30	15	30	46	31	17	30	16	16	17	17	18	18	19	19	20	20
	40	27	30	28	1	28	33	29	4	29	35	30	6	30	37	31	9	40	21	21	22	22	23	23	24	25	25	26
	50	27	22	27	53	28	24	28	55	29	27	29	58	30	29	31	0	50	26	27	27	28	28	29	29	30	30	31
59	0	27	15	27	45	28	16	28	47	29	18	29	49	30	20	30	51	0	0	1	1	2	2	3	3	4	4	5
	10	27	7	27	37	28	8	28	39	29	10	29	40	30	11	30	42	10	5	6	6	7	7	8	8	9	9	10
	20	26	59	27	29	28	0	28	31	29	1	29	32	30	2	30	33	20	10	11	11	12	12	13	13	14	14	15
	30	26	51	27	21	27	51	28	22	28	53	29	23	29	54	30	24	30	15	16	16	17	17	18	18	19	19	20
	40	26	43	27	13	27	44	28	14	28	44	29	14	29	45	30	15	40	20	21	21	22	22	23	23	24	24	25
	50	26	35	27	5	27	35	28	6	28	36	29	6	29	36	30	6	50	25	26	26	27	27	28	28	29	29	30

Prop. parts to min. of altit.	1'	2'	3'	4'	5'	6'	7'	8'	9'	Sub.
	1"	2"	2"	3'	4"	5"	6"	6"	7"	

TABLE XXII.

CORRECTION OF THE MOON'S APPARENT ALTITUDE.

☽ App altit.		Horizontal Parallax.																Prop. parts for Seconds of Par.										
		54"		55"		56"		57"		58"		59"		60"		61"			0"	1"	2"	3"	4"	5"	6"	7"	8"	9"
°	'	'	"	'	"	'	"	'	"	'	"	'	"	'	"	'	"	"	"	"	"	"	"	"	"	"	"	"
60	0	26	27	26	57	27	27	27	57	28	27	28	57	29	27	29	57	0	0	0	1	1	2	2	3	3	4	4
	10	26	19	26	49	27	19	27	49	28	19	28	48	29	19	29	48	10	5	5	6	6	7	7	8	8	9	9
	20	26	11	26	41	27	11	27	40	28	10	28	40	29	9	29	39	20	10	10	11	11	12	12	13	13	14	14
	30	26	3	26	33	27	2	27	32	28	1	28	31	29	0	29	30	30	15	15	16	16	17	17	18	18	19	19
	40	25	55	26	25	26	54	27	23	27	53	28	22	28	52	29	21	40	20	20	21	21	22	22	23	23	24	24
	50	25	47	26	16	26	46	27	15	27	44	28	18	28	43	29	12	50	25	25	26	26	27	27	28	28	29	29
61	0	25	39	26	8	26	37	27	6	27	36	28	5	28	34	29	3	0	0	0	1	1	2	2	3	3	4	4
	10	25	31	26	0	26	29	26	58	27	27	27	56	28	25	28	54	10	5	5	6	6	7	7	8	8	9	9
	20	25	23	25	52	26	21	26	49	27	18	27	47	28	16	28	45	20	10	10	10	11	11	12	12	13	13	14
	30	25	15	25	44	26	12	26	41	27	10	27	38	28	7	28	35	30	14	15	15	16	16	17	17	18	18	19
	40	25	7	25	35	26	4	26	32	27	1	27	29	27	58	28	26	40	19	20	20	21	21	21	22	22	23	23
	50	24	59	25	27	25	56	26	24	26	52	27	21	27	49	28	17	50	24	24	25	25	26	26	27	27	28	28
62	0	24	51	25	19	25	47	26	15	26	43	27	12	27	40	28	8	0	0	0	1	1	2	2	3	3	4	4
	10	24	43	25	11	25	39	26	7	26	35	27	3	27	31	27	59	10	5	5	6	6	6	7	7	8	8	9
	20	24	35	25	2	25	30	35	58	26	26	26	54	27	22	27	50	20	9	10	10	11	11	12	12	12	13	13
	30	24	26	24	54	25	22	25	50	26	17	26	45	27	13	27	40	30	14	14	15	15	16	16	17	17	18	18
	40	24	18	24	46	25	13	25	41	26	8	26	36	27	4	27	31	40	18	19	19	20	20	21	21	22	22	23
	50	24	10	24	37	25	5	25	32	26	0	26	27	26	54	27	22	50	23	24	24	24	25	25	26	26	27	27
63	0	24	2	24	29	24	56	25	25	25	51	26	18	26	45	27	13	0	0	0	1	1	2	2	3	3	4	4
	10	23	54	24	21	24	48	25	15	25	42	26	9	26	36	27	3	10	4	5	5	6	6	7	7	8	8	8
	20	23	45	24	12	24	39	25	6	25	33	26	0	26	27	26	54	20	9	9	10	10	11	11	12	12	12	13
	30	23	37	24	4	24	31	24	58	25	24	25	51	26	18	26	45	30	13	14	14	15	15	16	16	17	17	17
	40	23	29	23	56	24	22	24	49	25	15	25	42	26	9	26	35	40	18	18	19	19	20	20	21	21	21	22
	50	23	21	23	47	24	14	24	40	25	7	25	33	26	0	26	26	50	22	23	23	24	24	25	25	25	26	26
64	0	23	13	23	39	24	5	24	31	24	58	25	24	25	50	26	17	0	0	0	1	1	2	2	3	3	3	4
	10	23	4	23	30	23	57	24	22	24	49	25	15	25	41	26	7	10	4	5	5	6	6	6	7	7	8	8
	20	22	56	23	22	23	48	24	14	24	40	25	6	25	32	25	58	20	9	9	9	10	10	11	11	12	12	12
	30	22	48	23	14	23	39	24	5	24	31	24	57	25	23	25	48	30	13	13	14	14	15	15	15	16	16	17
	40	22	39	23	5	23	31	23	56	24	22	24	48	25	13	25	39	40	17	18	18	18	19	19	20	20	21	21
	50	22	31	22	57	23	22	23	48	24	13	24	39	25	4	25	30	50	22	22	22	23	23	24	24	25	25	25
65	0	22	23	22	48	23	13	23	39	24	4	24	30	24	55	25	20	0	0	0	1	1	2	2	2	3	3	4
	10	22	14	22	40	23	5	23	30	23	55	24	20	24	46	25	11	10	4	5	5	5	6	6	7	7	7	8
	20	22	6	22	31	22	56	23	21	23	46	24	11	24	36	25	1	20	8	9	9	10	10	10	11	11	12	12
	30	21	58	22	23	22	47	23	12	23	37	24	2	24	27	24	52	30	12	13	13	14	14	14	15	15	16	16
	40	21	49	22	14	22	39	23	3	23	28	23	53	24	18	24	43	40	17	17	17	18	18	19	19	19	20	20
	50	21	41	22	5	22	30	22	55	23	19	23	44	24	8	24	33	50	21	21	21	22	22	23	23	24	24	24
66	0	21	32	21	57	22	21	22	46	23	10	23	34	23	59	24	23	0	0	0	1	1	2	2	2	3	3	4
	10	21	24	21	48	22	13	22	37	23	1	23	25	23	50	24	14	10	4	4	5	5	6	6	6	7	7	8
	20	21	16	21	40	22	4	22	28	22	52	23	16	23	40	24	4	20	8	8	9	9	10	10	10	11	11	12
	30	21	7	21	31	21	55	22	19	22	43	23	7	23	31	23	55	30	12	12	13	13	14	14	14	15	15	16
	40	20	59	21	22	21	46	22	10	22	34	22	58	23	21	23	45	40	16	16	17	17	18	18	18	19	19	20
	50	20	50	21	14	21	37	22	1	22	25	22	48	23	12	23	35	50	20	20	21	21	21	22	22	23	23	23
67	0	20	42	21	5	21	29	21	52	22	16	22	39	23	2	23	26	0	0	0	1	1	2	2	2	3	3	3
	10	20	33	20	57	21	20	21	43	22	6	22	30	22	53	23	16	10	4	4	5	5	5	6	6	6	7	7
	20	20	25	20	48	21	11	21	34	21	57	22	20	22	44	23	7	20	8	8	8	9	9	10	10	10	11	11
	30	20	16	20	39	21	2	21	25	21	48	22	11	22	34	22	57	30	11	12	12	13	13	13	14	14	14	15
	40	20	7	20	31	20	53	21	16	21	39	22	2	22	25	22	47	40	15	16	16	16	17	17	18	18	18	19
	50	19	59	20	22	20	45	21	7	21	30	21	52	22	15	22	38	50	19	19	20	20	21	21	21	22	22	22
68	0	19	51	20	13	20	36	20	58	21	21	21	43	22	6	22	28	0	0	0	1	1	2	2	2	3	3	3
	10	19	42	20	4	20	27	20	49	21	11	21	34	21	56	22	18	10	4	4	4	5	5	5	6	6	7	7
	20	19	34	19	56	20	18	20	40	21	2	21	24	21	47	22	9	20	7	8	8	8	9	9	10	10	10	11
	30	19	25	19	47	20	9	20	31	20	53	21	15	21	37	21	59	30	11	11	12	12	12	13	13	14	14	14
	40	19	16	19	38	20	0	20	22	20	44	21	6	21	27	21	49	40	15	15	15	16	16	16	17	17	18	18
	50	19	8	19	30	19	51	20	13	20	35	20	56	21	18	21	39	50	18	19	19	19	20	20	20	21	21	22
69	0	18	59	19	21	19	42	20	4	20	25	20	47	21	8	21	30	0	0	0	1	1	1	2	2	2	3	3
	10	18	51	19	12	19	33	19	55	20	16	20	37	20	58	21	20	10	4	4	4	5	5	5	6	6	6	7
	20	18	42	19	3	19	24	19	46	20	7	20	28	20	49	21	10	20	7	7	8	8	8	9	9	9	10	10
	30	18	33	18	54	19	15	19	36	19	57	20	18	20	39	21	0	30	11	11	11	12	12	12	13	13	13	14
	40	18	25	18	46	19	6	19	27	19	48	20	9	20	30	20	51	40	14	14	15	15	15	16	16	16	17	17
	50	18	15	18	36	18	56	19	17	19	38	19	59	20	19	20	40	50	18	18	18	19	19	19	20	20	20	21

Prop. parts to min. of altit.	1'	2'	3'	4'	5'	6'	7'	8'	9'	Sub.
	1"	2"	2"	4"	4"	5"	6"	7"	8"	

TABLE XXII.

CORRECTION OF THE MOON'S APPARENT ALTITUDE.

☽ App altit.		Horizontal Parallax.																Prop. parts for Seconds of Par.										
		54′		55′		56′		57′		58′		59′		60′		61′			0′	1″	2″	3″	4″	5″	6″	7″	8″	9″
°	′	′	″	′	″	′	″	′	″	′	″	′	″	′	″	′	″	″	″	″	″	″	″	″	″	″	″	″
70	0	18	7	18	28	18	48	19	9	19	30	19	50	20	11	20	31	0	0	0	1	1	1	2	2	2	3	3
	10	17	59	18	19	18	39	19	0	19	20	19	41	20	1	20	21	10	3	4	4	4	5	5	5	6	6	6
	20	17	50	18	10	18	30	18	51	19	11	19	31	19	51	20	11	20	7	7	7	8	8	8	9	9	9	0
	30	17	41	18	1	18	21	18	41	19	1	19	22	19	42	20	2	30	10	10	11	11	11	12	12	12	13	13
	40	17	33	17	53	18	12	18	32	18	52	19	12	19	32	19	52	40	13	14	14	14	15	15	15	16	16	16
	50	17	24	17	44	18	3	18	23	18	43	19	2	19	22	19	42	50	17	17	17	18	18	18	19	19	19	20
71	0	17	15	17	35	17	54	18	14	18	33	18	53	19	12	19	32	0	0	0	1	1	1	2	2	2	3	3
	10	17	6	17	26	17	45	18	5	18	24	18	43	19	3	19	22	10	3	3	4	4	4	5	5	5	6	6
	20	16	58	17	17	17	36	17	55	18	15	18	34	18	53	19	12	20	6	7	7	7	8	8	8	9	9	9
	30	16	50	17	8	17	27	17	46	18	5	18	24	18	43	19	2	30	10	10	10	10	11	11	11	12	12	12
	40	16	40	16	59	17	18	17	37	17	56	18	15	18	33	18	52	40	13	13	13	14	14	14	15	15	15	16
	50	16	31	16	50	17	9	17	28	17	46	18	5	18	24	18	42	50	16	16	16	17	17	17	18	18	18	19
72	0	16	23	16	41	17	0	17	18	17	37	17	55	18	14	18	32	0	0	0	1	1	1	2	2	2	2	3
	10	16	14	16	32	16	51	17	9	17	27	17	46	18	4	18	23	10	3	3	4	4	4	5	5	5	5	6
	20	16	5	16	23	16	42	17	0	17	18	17	36	17	54	18	13	20	6	6	7	7	7	8	8	8	8	9
	30	15	56	16	14	16	32	16	50	17	9	17	26	17	45	18	3	30	9	9	10	10	10	11	11	11	11	12
	40	15	48	16	5	16	23	16	41	16	59	17	17	17	35	17	53	40	12	12	13	13	13	14	14	14	14	15
	50	15	39	15	56	16	14	16	32	16	50	17	7	17	25	17	43	50	15	15	16	16	16	17	17	17	17	18
73	0	15	30	15	47	16	5	16	22	16	40	16	58	17	15	17	33	0	0	0	1	1	1	1	2	2	2	3
	10	15	21	15	38	15	56	16	13	16	31	16	48	17	5	17	23	10	3	3	3	4	4	4	5	5	5	5
	20	15	12	15	29	15	47	16	4	16	21	16	38	16	55	17	13	20	6	6	6	7	7	7	7	8	8	8
	30	15	3	15	20	15	37	15	54	16	12	16	29	16	46	17	3	30	9	9	9	9	10	10	10	11	11	11
	40	14	54	15	11	15	28	15	45	16	2	16	19	16	36	16	53	40	11	12	12	12	12	13	13	13	14	14
	50	14	46	15	2	15	19	15	36	15	52	16	9	16	26	16	43	50	14	14	15	15	15	16	16	16	16	17
74	0	14	37	14	53	15	10	15	26	15	43	15	59	16	16	16	33	0	0	0	1	1	1	1	2	2	2	2
	10	14	28	14	44	15	1	15	17	15	33	15	50	16	6	16	22	10	3	3	3	3	4	4	4	5	5	5
	20	14	19	14	35	14	51	15	8	15	24	15	40	15	56	16	12	20	5	6	6	6	6	7	7	7	7	8
	30	14	10	14	26	14	42	14	58	15	14	15	30	15	46	16	2	30	8	8	9	9	9	9	10	10	10	10
	40	14	1	14	17	14	33	14	49	15	5	15	20	15	36	15	52	40	11	11	11	11	12	12	12	13	13	13
	50	13	52	14	8	14	24	14	39	14	55	15	11	15	26	15	42	50	13	14	14	14	14	15	15	15	15	16
75	0	13	43	13	59	14	14	14	30	14	45	15	1	15	16	15	32	0	0	0	1	1	1	1	2	2	2	2
	10	13	34	13	50	14	5	14	20	14	36	14	51	15	7	15	22	10	3	3	3	3	4	4	4	4	5	5
	20	13	25	13	41	13	56	14	11	14	26	14	41	14	57	15	12	20	5	5	6	6	6	6	7	7	7	7
	30	13	16	13	32	13	47	14	2	14	17	14	32	14	47	15	2	30	8	8	8	8	9	9	9	9	10	10
	40	13	8	13	22	13	37	13	52	14	7	14	22	14	37	14	52	40	10	10	11	11	11	11	12	12	12	12
	50	12	59	13	13	13	28	13	43	13	57	14	12	14	27	14	41	50	13	13	13	13	14	11	14	14	15	15
76	0	12	50	13	4	13	19	13	33	13	48	14	2	14	17	14	31	0	0	0	0	1	1	1	1	2	2	2
	10	12	41	12	55	13	9	13	24	13	38	13	52	14	7	14	21	10	2	3	3	3	3	3	4	4	4	4
	20	12	32	12	46	13	0	13	14	13	28	13	43	13	57	14	11	20	5	5	5	5	6	6	6	6	7	7
	30	12	23	12	37	12	51	13	5	13	19	13	33	13	47	14	1	30	7	7	7	8	8	8	8	9	9	9
	40	12	14	12	28	12	41	12	55	13	9	13	23	13	37	13	51	40	9	10	10	10	10	10	11	11	11	11
	50	12	5	12	18	12	32	12	46	12	59	13	13	13	27	13	40	50	12	12	12	12	13	13	13	13	14	14
77	0	11	56	12	9	12	23	12	36	12	50	13	3	13	17	13	30	0	0	0	0	1	1	1	1	2	2	2
	10	11	47	12	0	12	13	12	27	12	40	12	53	13	7	13	20	10	2	2	3	3	3	3	4	4	4	4
	20	11	38	11	51	12	4	12	17	12	30	12	43	12	57	13	10	20	4	5	5	5	5	6	6	6	6	6
	30	11	29	11	42	11	55	12	8	12	21	12	34	12	47	13	0	30	7	7	7	7	7	8	8	8	8	9
	40	11	20	11	32	11	45	11	58	12	11	12	24	12	37	12	49	40	9	9	9	9	10	10	10	10	10	11
	50	11	11	11	23	11	36	11	49	12	1	12	14	12	26	12	39	50	11	11	11	12	12	12	12	12	13	13
78	0	11	2	11	14	11	26	11	39	11	51	12	4	12	16	12	29	0	0	0	0	1	1	1	1	1	2	2
	10	10	52	11	5	11	17	11	29	11	42	11	54	12	6	12	19	10	2	2	2	3	3	3	3	3	4	4
	20	10	43	10	56	11	8	11	20	11	32	11	44	11	56	12	8	30	4	4	4	5	5	5	5	5	6	6
	30	10	34	10	46	10	58	11	10	11	22	11	34	11	46	11	58	30	6	6	6	7	7	7	7	7	8	8
	40	10	25	10	37	10	49	11	1	11	12	11	24	11	36	11	48	40	8	8	8	9	9	9	9	9	10	10
	50	10	16	10	28	10	39	10	51	11	3	11	14	11	26	11	38	50	10	10	10	11	11	11	11	11	12	12
79	0	10	7	10	19	10	30	10	41	10	53	11	4	11	16	11	27	0	0	0	0	1	1	1	1	1	1	2
	10	9	58	10	9	10	21	10	32	10	43	10	54	11	6	11	17	10	2	2	2	2	3	3	3	3	3	3
	20	9	49	10	0	10	11	10	22	10	33	10	44	10	56	11	7	20	4	4	4	4	4	5	5	5	5	5
	30	9	40	9	51	10	2	10	13	10	24	10	35	10	46	10	57	30	5	6	6	6	6	6	7	7	7	7
	40	0	31	9	42	9	52	10	3	10	14	10	25	10	35	10	46	40	7	7	8	8	8	8	8	9	9	9
	50	9	22	9	32	9	43	9	53	10	4	10	15	10	25	10	36	50	9	9	9	10	10	10	10	11	11	11

P. parts to	1′	2′	3′	4′	5′	6′	7′	8′	9′	Sub.
min. of alt.	1″	2″	3″	4″	5″	6″	7″	8″	9″	

TABLE XXII.

CORRECTION OF THE MOON'S APPARENT ALTITUDE.

☽ App altit.		Horizontal Parallax.								Prop. parts for Seconds of Par.									
		54′	55′	56′	57′	58′	59′	60′	61′		0″	1″	2″	3″	4″	5″	6″	7″	8″
°	′	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	″	″	″	″	″	″	″	″	″	″
80	0	9 13	9 23	9 33	9 44	9 54	10 5	10 15	10 25	0	0	0	0	0	1	1	1	1	1
	10	9 3	9 14	9 24	9 34	9 44	9 55	10 5	10 15	10	2	2	2	2	2	2	3	3	3
	20	8 54	9 4	9 15	9 25	9 35	9 45	9 55	10 5	20	3	3	4	4	4	4	4	4	5
	30	8 45	8 55	9 5	9 15	9 25	9 35	9 45	9 55	30	5	5	5	5	6	6	6	6	6
	40	8 36	8 46	8 56	9 5	9 15	9 25	9 34	9 44	40	7	7	7	7	7	7	8	8	8
	50	8 27	8 37	8 46	8 56	9 5	9 15	9 24	9 34	50	8	8	9	9	9	9	9	9	10
81	0	8 18	8 27	8 37	8 46	8 55	9 5	9 14	9 24	0	0	0	0	0	1	1	1	1	1
	10	8 9	8 18	8 27	8 36	8 46	8 55	9 4	9 13	10	1	2	2	2	2	2	2	3	3
	20	8 0	8 9	8 18	8 27	8 36	8 45	8 54	9 3	20	3	3	3	3	4	4	4	4	4
	30	7 50	7 59	8 8	8 17	8 26	8 35	8 44	8 52	30	4	5	5	5	5	5	5	5	6
	40	7 41	7 50	7 59	8 7	8 16	8 25	8 33	8 42	40	6	6	6	6	7	7	7	7	7
	50	7 32	7 41	7 49	7 58	8 6	8 15	8 23	8 32	50	7	8	8	8	8	8	8	8	9
82	0	7 23	7 31	7 40	7 48	7 56	8 5	8 13	8 21	0	0	0	0	0	1	1	1	1	1
	10	7 14	7 22	7 30	7 38	7 46	7 55	8 3	8 11	10	1	1	2	2	2	2	2	2	2
	20	7 5	7 13	7 21	7 29	7 37	7 45	7 53	8 1	20	3	3	3	3	3	3	3	4	4
	30	6 55	7 3	7 11	7 19	7 27	7 35	7 42	7 50	30	4	4	4	4	4	5	5	5	5
	40	6 46	6 54	7 2	7 9	7 17	7 25	7 32	7 40	40	5	5	5	6	6	6	6	6	6
	50	6 37	6 45	6 52	7 0	7 7	7 14	7 22	7 29	50	7	7	7	7	7	7	7	7	8
83	0	6 28	6 35	6 42	6 50	6 57	7 4	7 12	7 19	0	0	0	0	0	0	1	1	1	1
	10	6 19	6 26	6 33	6 40	6 47	6 54	7 2	7 9	10	1	1	1	1	2	2	2	2	2
	20	6 9	6 16	6 23	6 30	6 37	6 44	6 51	6 58	20	2	2	2	3	3	3	3	3	3
	30	6 0	6 7	6 14	6 21	6 27	6 34	6 41	6 48	30	3	4	4	4	4	4	4	4	4
	40	5 51	5 58	6 4	6 11	6 18	6 24	6 31	6 37	40	5	5	5	5	5	5	5	5	5
	50	5 42	5 48	5 55	6 1	6 8	6 14	6 21	6 27	50	6	6	6	6	6	6	6	6	7
84	0	5 33	5 39	5 45	5 52	5 58	6 4	6 10	6 17	0	0	0	0	0	0	0	1	1	1
	10	5 23	5 30	5 36	5 42	5 48	5 54	6 0	6 6	10	1	1	1	1	1	1	2	2	2
	20	5 14	5 20	5 26	5 32	5 38	5 44	5 50	5 56	20	2	2	2	2	2	2	2	3	3
	30	5 5	5 11	5 17	5 22	5 28	5 34	5 40	5 45	30	3	3	3	3	3	3	3	4	4
	40	4 56	5 1	5 7	5 13	5 18	5 24	5 29	5 35	40	4	4	4	4	4	4	4	5	5
	50	4 47	4 52	4 57	5 3	5 8	5 14	5 19	5 24	50	5	5	5	5	5	5	5	5	6
85	0	4 37	4 43	4 48	4 53	4 58	5 4	5 9	5 14	0	0	0	0	0	0	0	0	1	1
	10	4 28	4 33	4 38	4 43	4 48	4 53	4 59	5 4	10	1	1	1	1	1	1	1	1	1
	20	4 19	4 24	4 29	4 34	4 38	4 43	4 48	4 53	20	2	2	2	2	2	2	2	2	2
	30	4 10	4 14	4 19	4 24	4 29	4 33	4 38	4 43	30	2	2	2	3	3	3	3	3	3
	40	4 0	4 5	4 10	4 14	4 19	4 23	4 28	4 32	40	3	3	3	3	3	4	4	4	4
	50	3 51	3 56	4 0	4 4	4 9	4 13	4 17	4 22	50	4	4	4	4	4	4	4	4	5
86	0	3 42	3 46	3 50	3 55	3 59	4 3	4 7	4 11	0	0	0	0	0	0	0	0	0	0
	10	3 33	3 37	3 41	3 45	3 49	3 53	3 57	4 1	10	1	1	1	1	1	1	1	1	1
	20	3 24	3 27	3 31	3 35	3 39	3 43	3 47	3 50	20	1	1	1	1	1	2	2	2	2
	30	3 14	3 18	3 22	3 25	3 29	3 33	3 36	3 40	30	2	2	2	2	2	2	2	2	2
	40	3 5	3 9	3 12	3 16	3 19	3 23	3 26	3 30	40	2	3	3	3	3	3	3	3	3
	50	2 56	2 59	3 2	3 6	3 9	3 12	3 16	3 19	50	3	3	3	3	3	3	3	3	4
87	0	2 46	2 50	2 53	2 56	2 59	3 2	3 5	3 9	0	0	0	0	0	0	0	0	0	0
	10	2 37	2 40	2 43	2 46	2 49	2 52	2 55	2 58	10	0	0	1	1	1	1	1	1	1
	20	2 28	2 31	2 34	2 36	2 39	2 42	2 45	2 48	20	1	1	1	1	1	1	1	1	1
	30	2 19	2 21	2 24	2 27	2 29	2 32	2 35	2 37	30	1	1	1	1	1	2	2	2	2
	40	2 10	2 12	2 14	2 17	2 19	2 22	2 24	2 27	40	2	2	2	2	2	2	2	2	2
	50	2 0	2 3	2 5	2 7	2 9	2 12	2 14	2 16	50	2	2	2	2	2	2	2	2	3
88	0	1 51	1 53	1 55	1 57	1 59	2 2	2 4	2 6	0	0	0	0	0	0	0	0	0	0
	10	1 42	1 44	1 46	1 48	1 50	1 51	1 53	1 55	10	0	0	0	0	0	0	0	0	0
	20	1 33	1 34	1 36	1 38	1 40	1 41	1 43	1 45	20	1	1	1	1	1	1	1	1	1
	30	1 23	1 25	1 26	1 28	1 30	1 31	1 33	1 34	30	1	1	1	1	1	1	1	1	1
	40	1 14	1 15	1 17	1 18	1 20	1 21	1 22	1 24	40	1	1	1	1	1	1	1	1	1
	50	1 5	1 6	1 7	1 8	1 10	1 11	1 12	1 13	50	1	1	1	1	1	1	1	1	2
89	0	0 56	0 57	0 58	0 59	1 0	1 1	1 2	1 3	0	0	0	0	0	0	0	0	0	0
	10	0 46	0 47	0 48	0 49	0 50	0 51	0 52	0 52	10	0	0	0	0	0	0	0	0	0
	20	0 37	0 38	0 38	0 39	0 40	0 41	0 41	0 42	20	0	0	0	0	0	0	0	0	0
	30	0 28	0 28	0 29	0 29	0 30	0 30	0 31	0 31	30	0	0	0	0	0	0	0	0	0
	40	0 18	0 19	0 19	0 20	0 20	0 20	0 21	0 21	40	0	0	0	0	0	0	0	0	0
	50	0 9	0 9	0 10	0 10	0 10	0 10	0 10	0 10	50	1	1	1	1	1	1	1	1	1

Prop. parts to { 1′ 2′ 3′ 4′ 5′ 6′ 7′ 8′ 9′ } Sub.
min. of altit. { 1″ 2″ 3″ 4″ 5″ 6″ 7″ 8″ 9″ }

TABLE XXIII.

The Mean Reduction of the Moon's Horizontal Parallax, answering to any Latitude, according to the spherical figure of the Earth.

Latitude	11	19°	25°	30°	34°	39°	43°	47°	51°	56°	60°	65°	71°	79°	90°
Reduction	1″	2″	2½″	3″	4″	4½″	5″	6″	7″	8″	9″	10″	10½″	11″	

TABLE XXIV·—The Sun's true and apparent Altitude.

Alt.	⊙'s Corr.Alt.	Alt.	⊙'s Corr.Alt.	Alt.	⊙'s Corr.Alt.	Alt.	⊙'s Corr.Alt.	Alt.	⊙'s Corr.Alt.
	′ ″		′ ″		′ ″		′ ″		′ ″
2.30	2.13.46	12.00	11.55.46	30	21.27.45	32.00	31.58.36	30	51.29.20
40	2.24.24	10	12. 5.49	40	21.37.46	20	32 18.37	52.00	51.59.21
50	2.35.00	20	12.15.53	50	21.47.47	40	32.38.38	30	52.29.21
3·00	2.45.33	30	12.25.56	22.00	21.57.48	33.00	32.58.39	53.00	52.59.22
10	2.56. 5	40	12.35.59	10	22. 7.49	20	33.18.41	30	53.29.23
20	3. 6.35	50	12.46. 3	20	22.17.50	40	33.38.42	54.00	53.59.24
30	3.17. 3	13.00	12.56. 6	30	22.27.51	34.00	33.58.43	30	54.29.24
40	3.27.30	10	13. 6. 9	40	22.37.52	20	34.18.44	55.00	54.59.25
50	3.37.55	20	13.16.12	50	22.47.53	40	34.38.45	30	55.29.26
4.00	3.48.18	30	13.26.15	23.00	22.57.54	35.00	34.58.46	56.00	55.59.27
10	3.58.41	40	13.36.18	10	23. 7.55	20	35.18.47	30	56.29.27
20	4. 9. 2	50	13.46.21	20	23.17.56	40	35.38.48	57.00	56.59.28
30	4.19.22	14.00	13.56.23	30	23.27.57	36.00	35.58.49	30	57.29.28
40	4.29.41	10	14. 6.26	40	23.37.58	20	36.18.50	58.00	57.59.29
50	4.39.59	20	14.16.29	50	23.48.59	40	36.38.50	30	58.29.29
5.00	4.50.16	30	14.26.31	24.00	23.58.00	37.00	36.58.51	59.00	58.59.30
10	5. 0.32	40	14.36.34	10	24. 8. 1	20	37.18.52	30	59 29.30
20	5.10.47	50	14.46.36	20	24.18. 2	40	37.38.53	60.00	59.59.31
30	5.21. 2	15.00	14.56.39	30	24.28. 3	38.00	37.58.54	30	60.29.32
40	5.31.16	10	15. 6.41	40	24.38. 4	20	38 18.55	61.00	60.59.33
50	5.41.29	20	15.16.43	50	24.48. 5	40	38.38.56	30	61.29.33
6.00	5.51.42	30	15.26.45	25.00	24.58. 6	39.00	38.58.57	62.00	61.59.34
10	6. 1.54	40	15.36.48	10	25. 8. 7	20	39.18.58	30	62.29.34
20	6.12. 6	50	15.46.50	20	25.18. 8	40	39.38.59	63.00	62.59.35
30	6.22.17	16.00	15.56.52	30	25.28. 9	40.00	39.58.59	30	63.29.35
40	6.32.28	10	16. 6.54	40	25.38.10	20	40.19. 0	64.00	63.59.36
50	6.42.68	20	16.16.56	50	25.48.11	40	40.39. 1	30	64.29.36
7.00	6.52.48	30	16.26.58	26.00	25.18.12	41.00	40.59. 1	65.00	64.59.37
10	7. 2.57	40	16.37.00	10	26. 8.13	20	41.19. 2	30	65.29.37
20	7.13. 6	50	16.47. 2	20	26.18.14	40	41.39. 3	66.00	65.59.38
30	7.23.15	17.00	16.57. 4	30	26.28.14	42.00	41.59. 3	30	66.29.38
40	7.33.23	10	17. 7. 6	40	26.38.15	20	42.19. 4	67.00	66.59.39
50	7.43.31	20	17.17. 8	50	26.48.16	40	42.39. 4	30	67.29.39
8.00	7.53.39	30	17.27.10	27.00	26.58.17	43.00	42.59. 5	68.00	67.59.40
10	8. 3.47	40	17.37.11	10	27. 8.18	20	43.19. 5	30	68.29.40
20	8.13.54	50	17.47.13	20	27.18.18	40	43.39. 6	69.00	68 59.41
30	8.24. 1	18.00	17.57.15	30	27.28.19	44.00	43.59. 7	70.00	69.59.42
40	8.34. 8	10	18. 7.17	40	27.38.19	20	44.19. 7	71 00	70.59.43
50	8.44.14	20	18.17.18	50	27.48.30	40	44.39. 8	72.00	71.59.44
9.00	8.54.20	30	18.27.20	28.00	27.58.21	45.00	44.59. 9	73.00	72.59.45
10	9. 4.26	40	18.37.22	10	28. 8.22	20	45.19. 9	74.00	73.59.46
20	9.14.32	50	18.47.23	20	28.18.22	40	45.39.10	75.00	74.59.47
30	9.24.38	19.00	18.57.24	30	28.28.23	46.00	45.59.11	76.00	75.59.48
40	9.34.43	10	19.47.25	40	28.38.23	20	46.19.11	77.00	76.59.49
50	9.44.48	20	19.17.27	50	28.48.24	40	46.39.12	78.00	77.59.50
10.00	9.54.54	30	19.27.28	29.00	28.58.25	47.00	46.59 13	79.00	78.59.51
10	10. 4.59	40	19.37.29	10	29. 8.26	20	47·19.14	80.00	79.59.52
20	10.15. 4	50	19.47.31	20	29.18.26	40	47.39.14	81.00	80.59.52
30	10.25. 9	20.00	19.57.32	30	29.28.27	48.00	47.59.15	82.00	81.59.53
40	10.35.13	10	20. 7.33	40	29.38.28	20	48.19.15	83.00	82.59.54
50	10.45.18	20	20.17.35	50	29.48.29	40	48.39.16	84.00	83.59.55
11.00	10.55.12	30	20.27.36	30.00	29.58.29	49.00	48.59.16	85.00	84.59.56
10	11. 5.26	40	20.37.38	20	30.18.31	20	49.19.17	86.00	85.59.57
20	11.15.30	50	20.47.39	40	30.38.32	40	49.39.17	87.00	86.59.57
30	11.25.34	21.00	20.57.41	31.00	30.58.33	50.00	49.59.18	88.00	87.59.58
40	11.35.38	10	21. 7.42	20	31.18.34	30	50.29.18	89.00	88.59.59
50	11.45.42	20	21.17.43	40	31.38.35	51.00	50.59.19	90.00	90. 0. 0

TABLE XXV.

The refracted Semi-diameter of the Moon.

☽'s Semi-diameter by the Nautical Almanac.

Apt. Alt.	14.40	15.00	15.20	15.40	16.00	16.20	16.40
′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″
4.00	15.16	15.36	15.56	16.16	16.36	16.56	17.16
5	15.15	15.35	15.55	16.15	16.35	16.55	17.15
10	15.14	15.34	15.54	16.14	16.34	16.54	17.14
20	15.13	15.33	15.53	16.13	16.33	16.53	17.13
25	15.12	15.32	15.52	16.12	16.32	16.52	17.12
30	15.11	15.31	15.51	16.11	16.31	16.51	17.11
35	15.10	15.30	15.50	16.10	16.30	16.50	17.10
40	15. 9	15.29	15.49	16. 9	16.29	16.49	17. 9
50	15. 8	15.28	15.48	16. 8	16.28	16.48	17. 8
5.00	15. 7	15.27	15.47	16. 7	16.27	16.47	17. 7
10	15. 6	15.26	15.46	16. 6	16.26	16.46	17. 6
20	15. 5	15.25	15.45	16. 5	16.25	16.45	17. 5
30	15. 4	15.24	15.44	16. 4	16.24	16.44	17. 4
40	15. 3	15.23	15.43	16. 3	16.23	16.43	17. 3
50	15. 2	15.22	15.42	16. 2	16.22	16.42	17. 2
6.00	15. 1	15.21	15.41	16. 1	16.21	16.41	17. 1
10	15. 0	15.20	15.40	16. 0	16.20	16.40	17. 0
20	14.59	15.19	15.39	15.59	16.19	16.39	16.59
30	14.58	15.18	15.38	15.58	16.18	16.38	16.58
40	14.57	15.17	15.37	15.57	16.17	16.37	16.57
7.00	14.56	15.16	15.36	15.56	16.16	16.36	16.56
20	14.55	15.15	15.35	15.55	16.15	16.35	16.55
40	14.54	15.14	15.34	15.54	16.14	16.34	16.54
8.00	14.53	15.13	15.33	15.53	16.13	16.33	16.53
30	14.52	15.12	15.32	15.52	16.12	16.32	16.52
9.00	14.51	15.11	15.31	15.51	16.11	16.31	16.51
10.00	14.50	15.10	15.30	15.50	16.11	16.31	16.51
11.00	14.49	15. 9	15.29	15.49	16.10	16.30	16.50
12.00	14.48	15. 8	15.28	15.48	16. 9	16.29	16.49
13.00	14.47	15. 7	15.27	15.47	16. 8	16.28	16.48
14.00	14.48	15. 8	15.28	15.48	16. 8	16.29	16.49
16.00	14.47	15. 7	15.27	15.47	16. 7	16.28	16.48
18.00	14.47	15. 7	15.28	15.48	16. 8	16.28	16.49
19.00	14.46	15. 6	15.27	15.47	16. 7	16.27	16.48
21.00	14.47	15. 7	15.28	15.48	16. 8	16.28	16.49
24.00	14.47	15. 7	15.27	15.48	16. 8	16.28	16.48
27.00	14.47	15. 8	15.28	15.48	16. 9	16.29	16.49
30.00	14.48	15. 8	15.29	15.48	16. 9	16.30	16.50
33.00	14.49	15. 9	15.29	15.49	16.10	16.30	16.51
36.00	14.49	15. 9	15.30	15.50	16.11	16.31	16.52
39.00	14.50	15.10	15.31	15.51	16.12	16.32	16.52
42.00	14.50	15.10	15.31	15.52	16.12	16.33	16.53
45.00	14.50	15.10	15.31	15.51	16.12	16.32	16.53
48.00	14.50	15.10	15.31	15.52	16.12	16.33	16.53
51.00	14.51	15.12	15.32	15.52	16.13	16.33	16.54
54.00	14.51	15.12	15.32	15.53	16.13	16.34	16.54
57.00	14.52	15.13	15.33	15.53	16.14	16.34	16.55
60.00	14.52	15.13	15.13	15.54	16.14	16.35	16.56
65.00	14.53	15.14	15.44	15.55	16.15	16.36	16.56
70.00	14.53	15.14	15.14	15.55	16.16	16.36	16.57
75.00	14.54	15.14	15.15	15.55	16.16	16.36	16.57
80.00	14.54	15.14	15.15	15.56	16.16	16.37	16.58
90.00	14.54	15.15	15.15	15.56	16.17	16.37	16.58

TABLE XXVI.

The augmented lower Semi-diameter of the Mo

☽'s Semi-diameter by the Nautical Almanack.

Apt. Alt.	14′40″	15′00″	15′20″	15′40″	16′00″	16′20″
	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″
3	14.41	15. 1	15.21	15.41	16. 1	16.21
6	14.42	15. 2	15.22	15.42	16. 2	16.22
9	14.42	15. 2	15.23	15.43	16. 3	16.23
12	14.43	15. 3	15.23	15.43	16. 4	16.24
15	14.44	15. 4	15.24	15.44	16. 4	16.25
18	14.44	15. 4	15.25	15.45	16. 5	16.25
21	14.45	15. 5	15.21	15.46	16. 6	16.26
24	14.46	15. 6	15.26	15.47	16. 7	16.27
27	14.46	15. 6	15.27	15.47	16. 8	16.28
30	14.47	15. 7	15.28	15.48	16. 8	16.29
33	14.48	15. 8	15.28	15.48	16. 9	16.29
36	14.48	15. 8	15.29	15.49	16.10	16.30
39	14.49	15. 9	15.30	15.50	16.11	16.31
42	14.49	15. 9	15.30	15.51	16.11	16.32
45	14.50	15.10	15.31	15.51	16.12	16.32
48	14.50	15.10	15.31	15.52	16.12	16.33
51	14.51	15.12	15.32	15.52	16.13	16.33
54	14.51	15.12	15.32	15.53	16.13	16.34
57	14.52	15.13	15.33	15.53	16.14	16.34
60	14.52	15.13	15.13	15.54	16.14	16.35
65	14.53	15.14	15.14	15.55	16.15	16.36
70	14.53	15.14	15.14	15.55	16.16	16.36
75	14.54	15.14	15.15	15.55	16.16	16.36
80	14.54	15.14	15.15	15.56	16.16	16.37
90	14.54	15.15	15.15	15.56	16.17	16.37

TABLE XXVII.

The lower Apparent Semi-diameter of the

⊙'s Semi-diameter by the Nautical Alma

Apt. Alt.	15′.46″	15′.52″	15′.58″	16′. 4″	16′.10″
4.00	16.21	16.27	16.33	16.39	16.45
10	16.19	16.25	16.31	16.37	16.43
20	16.18	16.24	16.30	16.36	16.42
30	16.16	16.22	16.28	16.34	16.40
40	16.14	16.20	16.26	16.32	16.38
50	16.13	16.19	16.25	16.31	16.37
5.00	16.11	16.17	16.23	16.29	16.35
10	16.10	16.16	16.22	16.28	16.34
30	16. 8	16.14	16.20	16.26	16.32
40	16. 7	16.13	16.19	16.25	16.31
6.00	16. 5	16.11	16.17	16.23	16.29
20	16. 3	16. 9	16.15	16.21	16.27
40	16. 1	16. 7	16.13	16.19	16.25
7.00	16. 0	16. 6	16.12	16.18	16.24
40	15.58	16. 4	16.10	16.16	16.22
8.30	15.56	16. 2	16. 8	16.14	16 20
9.00	15.55	16. 1	16. 7	16.13	16.19
11.00	15.53	15.59	16. 5	16.11	16.17
14.00	15.50	15.56	16. 2	16. 8	16.14
18.00	15.48	15.54	16. 0	16. 6	16.12
19.00	15.47	15.53	15.59	16. 5	16.11
90.00	15.46	15.52	15.58	16. 4	16.10

TABLE XXVIII.

The Semi-diameter of the Sun or Moon at different Altitudes from their Centres, to any part of their lower Semi-circumference.

	Apparent Altitudes.																												
Deg. of Circum.	4°						5°				6°			7°			8°		Degrees.										
	00	10	20	30	40	50	00	10	20	40	00	20	40	00	20	40	00	30	9	10	11	12	13	14	15	16	18	26	36
12	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0			
24	9	8	7	6	6	5	4	4	4	3	3	3	2	2	2	2	2	1	1	1	1	1	1	1	1	1			
36	14	13	12	11	10	10	9	9	8	8	7	6	5	5	5	4	4	4	3	3	3	2	2	1	1	1	1	1	1
48	20	19	18	17	16	15	14	13	12	11	10	9	8	8	7	6	6	5	5	4	4	3	3	2	2	2	1	1	1
54	21	20	19	18	17	17	16	15	14	13	12	10	10	9	8	8	7	6	6	5	5	4	4	3	3	2	1	1	1
60	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	7	6	5	4	4	3	3	2	2	2	1
66	27	26	25	24	23	22	21	20	19	17	16	14	13	12	11	10	9	8	7	6	5	5	4	3	3	3	2	2	1
72	29	28	27	26	25	24	23	22	21	19	17	15	14	13	12	11	10	9	8	7	6	5	4	4	3	3	2	2	1
78	30	29	28	27	26	25	24	23	22	20	18	16	15	14	13	12	11	10	9	7	6	5	4	4	3	3	2	2	1
84	35	33	32	30	28	27	25	24	23	21	19	17	15	14	13	12	11	10	9	8	6	5	4	4	3	3	3	2	1

TABLE XXIX.

The Semi-diameter of the ⊙ and ☽ reduced by the dip of the Horizon.

The Semi-diameter of the ⊙ and ☾ by the Nautical Almanac.													
	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″
Ht.	14.40	14.50	15.00	15.10	15.20	15.30	15.40	15.50	16.00	16.10	16.20	16.30	16.40
0	14.40	14.50	15.00	15.10	15.20	15.30	15.40	15.50	16,00	16.10	16.20	16.30	16.40
1	13.43	13.53	14. 3	14.13	14.23	14.33	14.43	14.53	15. 3	15.13	15.23	15.33	15.43
2	13.19	13.29	13.39	13.49	13.59	13.69	14.19	14.29	14.39	14.49	14.59	15. 9	15.19
3	13. 1	13.11	13.21	13.31	13.41	13.51	14. 1	14.11	14.21	14.31	14.41	14.51	15. 1
4	12.45	12.55	13. 5	13.15	13.25	13.35	13.45	13.55	14. 5	14.15	14.25	14.35	14.45
5	12.32	12.42	12.52	13. 2	13.22	13.22	13.32	13.42	13.52	14. 2	14.12	14.22	14.32
6	12.20	12.30	12.40	12.50	13 00	13.10	13.20	13.30	13.40	13.50	14.00	14.10	14.29
7	12. 9	12.19	12.29	12 39	12.49	12.59	13. 9	13.19	13.29	13.39	13.49	13.59	14. 9
8	11.58	12. 8	12.18	12.28	12.38	12.48	12.58	13. 8	13.18	13.28	13.38	13.48	13.58
9	11.48	11.58	12. 8	12.18	12.28	12.38	12.48	12.58	13. 8	13.18	13.28	13.38	13.48
10	11.39	11.49	11.59	12. 9	12.19	12.29	12.39	12.49	12.59	13· 9	13.19	13.29	13.39
11	11.30	11.40	11.50	12.00	12.10	12.20	12.30	12.40	12.50	13.00	13.10	13.20	13.30
12	11.22	11.32	11.42	11.52	12. 2	12.12	12.22	12.32	12.42	12.52	13. 2	13.12	13.22
13	11.14	11.24	11.34	11.44	11.54	12. 4	12.14	12.24	12,34	12 44	12.54	13. 4	13.14
14	11. 6	11.16	11.26	11.36	11.46	11.56	12. 6	12.16	12,26	12.36	12.46	12.56	13. 6
15	10.58	11. 8	11.18	11.28	11.38	11.48	11.58	12. 8	12.18	12.28	12.38	12.48	12.58
16	10.51	11. 1	11.11	11.21	11.31	11.41	11.51	12. 1	12,11	12.21	12.31	12.41	12.51
17	10.44	10.54	11. 4	11.14	11.24	11.34	11.44	11.54	12. 4	12.14	12.24	12.34	12 44
18	10.37	10.47	10.57	11. 7	11.17	11.27	11.37	11.47	11.57	12. 7	12.17	12.27	12.37
19	10.30	10.40	10.50	11. 0	11.10	11.20	11.30	11.40	11.50	12. 0	12.10	12.20	12.30
20	10.24	10.34	10.44	10 54	11. 4	11.14	11.24	11.34	11.44	11.54	12. 4	12.14	12.24
21	10.18	10.28	10.38	10.48	10.58	11. 8	11.18	11.28	11.38	11.48	11.58	12. 8	12.18
22	10.12	10.22	10.32	10.42	10.52	11. 2	11.12	11.22	11.32	11.42	11·52	12. 2	12.12
23	10· 6	10.16	10.26	10.36	10.46	10.56	11. 6	11.16	11.26	11.36	11.46	11.56	12. 6
24	10. 0	10.10	10.20	10.30	10.40	10.50	11. 0	11.10	11.20	11.30	11.40	11.50	12. 0
26	9.48	9.58	10. 8	10.18	10.28	10.38	10.48	10.58	11. 8	11.18	11.28	11.38	11.48
28	9.37	9.47	9.57	10. 7	10.17	10.27	10.37	10.47	10.57	11. 7	11.17	11.27	11.37
30	9.26	9.36	9.46	9.56	10. 6	10.16	10.26	10 36	10.46	10.56	11. 6	11.16	11.26
35	9. 1	9.11	9.21	9.31	9.41	9.51	10. 1	10.11	10,21	10.31	10.41	10.51	11· 1
40	8.38	8.48	8.58	9. 8	9.18	9.28	9.38	9.48	9.58	10. 8	10.18	10.28	10.38
45	8.16	8.26	8.36	8.46	8.56	9. 6	9.16	9.26	9.36	9.46	9.56	10. 6	10.16
50	7.56	8. 6	8.16	8.26	8.36	8.46	8.56	9. 6	9.16	9.26	9.36	9.46	9.56
60	7.17	7.27	7.37	7.47	7.57	8. 7	8.17	8.27	8.37	8.47	8.56	9. 7	9.17
70	6.41	6.51	7. 1	7.11	7.21	7.31	7.41	7.51	8. 1	8.11	8.21	8.31	8.41
80	6. 8	6.18	6.28	6.38	6.48	6.58	7. 8	7.18	7.28	7.38	7.48	7.58	8. 8
90	5.37	5.47	5.57	6. 7	6.17	6.27	6.37	6.47	6.57	7. 7	7.17	7.27	7.37
100	5. 7	5.17	5.27	5.37	5.47	5.57	6. 7	6.17	6.27	6.37	6.47	6.57	7. 7
100													

TABLE XXX.

The correction of the Stars Altitude to different heights of the horizon.

Stars ap. Alt.	The height of the eye above the horizon in feet.												
	6	7	8	9	10	11	12	13	14	15	16	17	18
0.40	29.20	29.31	29.41	29.51	30. 1	30.10	30.18	30.26	30.34	30.42	30.49	30.56	31. 3
0.55	27.25	27.36	27.46	27.57	28. 6	28.15	28.23	28.31	28.39	28.47	28.54	29. 1	29. 8
1.00	26.49	27.00	27.11	27.21	27.30	27.39	27.47	27.55	28.03	28.11	28.18	28.25	28.32
1.10	25.40	25.51	26. 2	26.12	26.21	26.31	26.38	26.46	26.54	27. 2	27. 9	27.16	27.23
1.20	24.35	24.46	24.57	25. 7	25.16	25.25	25.33	25.41	25.49	25.57	26. 4	26.11	26.18
1.30	23.35	23.46	23.57	24. 7	24.16	24.25	24.33	24.41	24.49	24.57	25. 4	25.11	25.18
1.40	22.38	22.49	23.00	23.10	23.19	23.29	23.36	23.44	23.52	24.00	24. 7	24.14	24.21
1.55	21.20	21.31	21.42	21.52	22. 1	22.10	22. 8	22.26	22.34	22.42	22.49	22.56	23. 3
2 5	20.31	20.42	20.53	21. 3	21.12	21.21	21.29	21.37	21.45	21.53	22.00	22. 7	22.14
2 20	19.24	19.55	19.46	19.56	20. 5	20.14	20 22	20.30	20.38	20.46	20.53	21.00	21. 7
2.35	18.24	18.35	18.46	18.56	19. 5	19.14	19.22	19.30	19.38	19.46	19.53	20.00	20. 7
2.50	17.29	17.40	17.51	18. 1	18.10	18.19	18.27	18.35	18.43	18.51	18.58	19. 5	19.12
3.10	16.24	16.35	16.46	16.56	17. 5	17.14	17.22	17.30	17.38	17.46	17.53	18.00	18. 4
3.30	15.26	15.37	15.48	15.58	16. 7	16.16	16.24	16.32	16.40	16.48	16.55	17. 2	17. 9
3.50	14.35	14.46	14.57	15. 7	15.16	15.25	15.33	15.41	15.49	15.57	16. 4	16.11	16.18
4.20	13.28	13.39	13.50	14. 0	14. 9	14.18	14.26	14.34	14.42	14.50	14.57	15. 4	15.11
4.50	12.31	12.42	12.53	13. 3	13.12	13.21	13.29	13.37	13.45	13.53	14. 0	14. 7	14.14
5.30	11.28	11.39	11.50	12.00	12. 9	12.18	12.26	12.34	12.42	12.50	12.57	13. 4	13.11
6.20	10.23	10.34	10.45	10.55	11. 4	11.13	11.21	11.29	11:37	11.45	11.52	11.59	12. 6
7.20	9.22	9.33	9.44	19.54	10. 3	10.13	10.28	10.28	10.36	10.44	10.51	10.58	11. 5
8.40	8.21	8.32	8.43	8.53	9. 2	9.11	9.19	9.27	9.35	9.43	9.50	9.57	10. 4
10.30	7.20	7.31	7.42	7.52	8. 1	8.10	8.18	8.26	8.34	8.42	8.49	8.56	9. 3
13..0	6.23	6.34	6.45	6.55	7. 4	7.13	7.21	7.29	7.37	7.45	7.52	7.59	8. 6
17.00	5.24	5.35	.5.46	5.56	6. 5	6.14	6.22	6.30	6.38	6.46	6.53	7.00	7. 7
25.00	4.22	4.33	4 44	4.54	5. 3	5.12	5.20	5.28	5.36	5.44	5.51	5.58	6. 5
42.00	3.23	3.34	3.45	3.55	4. 4	4.13	4.21	4.29	4.37	4.45	4.52	4.59	5. 6
44.00	3.19	3.30	3.41	3.51	4.00	4. 9	4.17	4.25	4.33	4.41	4.48	4.55	5. 2
45.00	3.17	3.28	3.39	3.49	3.58	4. 7	4.15	4.23	4.31	4.39	4.46	4.53	5. 0
46.00	3.15	3.26	3.37	3.47	3.56	4. 5	4.13	4.21	4.29	4.37	4.44	4.51	4.58
47.00	3.13	3 24	3.35	3.45	3.54	4. 3	4.11	4.19	4.27	4.35	4.42	4.49	4.56
48.00	3.11	3.22	3.33	3.43	3.52	4. 1	4. 9	4.17	4.25	4.33	4.40	4.47	4.54
49.00	3. 9	3.20	3.31	3.41	3.50	3.59	4. 7	4.15	4.23	4.31	4.38	4.45	4.52
50.00	3. 8	3.19	3.30	3.40	3.49	3.58	4. 6	4.14	4.22	4.30	4.37	4.44	4.51
51.00	3. 6	3.17	3.28	3.38	3.47	3.56	4. 4	4.12	4.20	4.28	4.35	4.42	4.49
52.00	3. 4	3.15	3.26	3.36	3.45	3.54	4. 2	4.10	4.18	4.26	4.33	4.40	4.47
53.00	3. 3	3.14	3.25	3.35	3.44	3.53	4. 1	4. 9	4.17	4.25	4.32	4.39	4.46
54.00	3. 1	3.12	3.23	3.33	3.42	3.51	3.59	4. 7	4.15	4.23	4.30	4.37	4.44
55.00	3. 0	3.11	3.22	3.32	3.41	3.50	3.58	4. 6	4.15	4.22	4.29	4.36	4.43
56.00	2.58	3. 9	3.20	3.30	3.39	3.48	3.56	4. 4	4.12	4.20	4.27	4.34	4.41
57.00	2.57	3. 8	3.19	3.29	3.38	3.47	3.55	4. 3	4.11	4.19	4.26	4.33	4.40
58.00	2.55	3. 6	3.17	3.27	3.36	3.45	3.53	4. 1	4. 9	4.17	4.24	4.31	4.38
59.00	2.54	3. 5	3.16	3.26	3.35	3.44	3.52	4. 0	4. 8	4.16	4.23	4.30	4.37
60.00	2.53	3. 4	3.15	3.25	3.34	3.43	3.51	3.59	4. 7	4.15	4.22	4.29	4.36
61.00	2.52	3. 3	3.14	3 24	3.33	3.42	3.50	3.58	4. 6	4.14	4.21	4.28	4.35
62.00	2.50	3. 1	3.12	3.22	3.31	3.40	3.48	3.56	4. 4	4.12	4.19	4.26	4.33
63.00	2.49	3. 0	3.11	3.21	3.30	3.39	3.47	3.55	4. 3	4.11	4.18	4.25	4.32
64.00	2.48	2.59	3.10	3.20	3.29	3.38	3.46	3.54	4. 2	4.10	4.17	4.24	4.31
65.00	2.46	2.57	3. 8	3.18	3.27	3.36	3.44	3.52	4. 0	4. 8	4.15	4.22	4.29
66 00	2.45	2.56	3. 7	3.17	3.26	3.35	3.43	3.51	3.59	4. 7	4.14	4.21	4.28
67.00	2.44	2.55	3. 6	3.16	3.25	3.34	3.42	3.50	3.58	4. 6	4.13	4.20	4.27
68.00	2.43	2.54	3. 5	3.15	3.24	3.33	3.41	3.49	3.57	4. 5	4.12	4.19	4.26
69.00	2.42	2.53	3. 4	3.14	3.23	3.32	3.40	3.48	3.56	4. 4	4.11	4.18	4.25
71.00	2.39	2.50	3. 1	3.11	3.20	3.29	3.37	3.45	3.53	4. 1	4. 8	4.15	4.22
73.00	2.37	2.48	2.59	3. 9	3.18	3.27	3.35	3.43	3.51	3.59	4. 6	4.13	4.20
75.00	2.35	2.46	2.57	3. 7	3.16	3.25	3.33	3.41	3.49	3.57	4. 4	4.11	4.18
77.00	2.33	2.44	2.55	3. 5	3.14	3.23	3.31	3.39	3.47	3.55	4. 2	4. 9	4.16
79.00	2.31	2.42	2.53	3. 3	3.12	3.21	3.29	3.37	3.45	3.53	4. 0	4. 7	4.14
81.00	2.29	2.40	2.51	3. 1	3.10	3.19	3.27	3.35	3.43	3.51	3.58	4. 5	4.12
83.00	2.27	2.38	2.49	2.59	3. 8	3.17	3.25	3.33	3.41	3.49	3.56	4. 3	4.10
85.00	2.25	2.36	2.47	2.57	3. 6	3.15	3.23	3.31	3.39	3.47	3.54	4. 1	4. 8
87.00	2.23	2.34	2.45	2.55	3. 4	3.13	3.21	3.29	3.37	3.45	3.52	3.59	4. 6
90.00	2.20	2.31	2.42	2.52	3. 1	3.10	3.18	3.26	3.34	3.42	3.49	3.56	4. 3

TABLE XXX.

The correction of the Stars Altitude to different heights of the horizon.

Stars ap alt.	The height of the eye above the horizon in feet.											
	19	20	21	22	23	24	26	28	30	35	40	45	50
0.40	31.30	31.10	31 22	31.28	31.34	31.40	31.52	32. 3	32.14	32.39	33. 2	33.24	33.42
0.55	29.15	29.21	29.27	29.33	29.39	29.45	29.57	30. 8	30.19	30.44	31. 7	31.29	31.49
1.00	28.39	28.45	28.51	28.57	29. 3	29. 9	29 21	29.32	29.43	30. 8	30.31	30.53	31.13
1.10	27.30	27.36	27.42	27.48	27.56	28.00	28.12	28.23	28.34	28.59	29.22	29.44	30. 4
1.20	26.25	26.31	26.37	26.43	26.49	26.55	27. 7	27.18	27.29	27.54	28.17	28.39	28.59
1.30	25.25	21.31	25.37	25.43	25.49	25.55	26. 7	26.18	26.29	26.54	27.17	27.39	27.59
1.40	24.28	24.34	24.40	24.46	24.52	24.58	25.10	25.21	25.32	25.57	26.20	26.42	27. 2
1.55	23.10	23.16	23.22	23.28	23.34	23.40	23.52	24. 3	24.14	24.39	25. 2	25.24	25.44
2. 5	22.21	22.27	22.33	22.39	22.45	22.51	23. 3	23.14	23.25	23.50	24.13	24.35	24.55
2.20	21.14	21.20	21.26	21.32	21.38	21.44	21.56	22. 7	22.18	22.43	23. 6	23.28	23.48
2.35	20.14	20.20	20.26	20.32	20.38	20.44	20.56	21. 7	21.18	21.43	22. 6	22.28	22.48
2.50	19.19	19.25	19.31	19.37	19.43	19.49	20. 1	20.12	20.23	20.48	21.11	21.33	21.53
3.10	18.14	18.20	18.26	18.32	18.38	18.44	18.56	19. 7	19.18	19.43	20. 6	20.28	20.48
3.30	17.16	17.22	17.28	17.34	17.40	17.46	17.58	18. 9	18.20	18.45	19. 8	19.30	19.50
3.50	16 25	16.31	16.37	16.43	16.49	16.55	17. 7	17.18	17.29	17.54	18.17	18.39	18.59
4.20	15.18	15.24	15.30	15.36	15.42	15.48	16. 0	16.11	16.22	16.47	17.10	17.32	17.52
4.50	14.21	14.27	14.33	14.39	14.45	14.51	15. 3	15.14	15.25	15.50	16.13	16.35	16.55
5.30	13.18	13.25	13.30	13.36	13.42	13.48	14. 0	14.11	14.22	14.47	15.10	15.32	15.52
6.20	12.13	12.19	12.25	12.31	12.37	12.43	12.55	13. 6	13.17	13.42	14. 5	14.27	14.47
7.20	11.12	11.18	11.24	11.30	11.36	11.42	11.54	12. 5	12.16	12.41	13. 4	13.26	13.46
8.40	10.11	10.17	10.23	10.29	10.35	10.41	10.53	11. 4	11.15	11.40	12. 3	12.25	12.45
10.30	9.10	9.16	9.22	9.28	9.34	9.40	9.52	10. 3	10.14	10.39	11. 2	11 24	11.44
13.00	8.13	8.19	8.25	8.31	8.37	8.43	8.55	9. 6	9.17	9.42	10. 5	10.27	10.47
17.00	7.14	7.20	7.26	7.32	7.38	7.44	7.56	8. 7	8.18	8.43	9. 6	9.28	9.48
25.00	6.12	6.18	6.24	6.30	6.36	6.42	6.54	7. 5	7.16	7.41	8. 4	8.26	8.46
43.00	5.11	5.17	5.23	5.29	5.35	5.41	5.53	6. 4	6.15	6.40	7. 8	7.25	7.45
44.00	5. 9	5.15	5.21	5.27	5.33	5.39	5.51	6. 2	6.13	6.38	7. 1	7.23	7.43
45.00	5. 7	5.13	5.19	5.25	5.31	5.37	5.49	6. 0	6.11	6.36	6.59	7.21	7.41
46.00	5. 5	5.11	5.17	5.23	5.29	5.35	5.47	5.58	6. 9	6.34	6.57	7.19	7.39
47.00	5. 3	5. 9	5.15	5.21	5.27	5.33	5.45	5.56	6. 7	6.32	6.55	7.17	7.37
48 00	5. 1	5. 7	5.13	5.19	5.25	5.31	5.43	5.54	6. 5	6.30	6.53	7.15	7.35
49.00	4.59	5. 5	5.11	5.17	5.23	5.29	5.41	5.52	6. 3	6.28	6.51	7.13	7.33
50.00	4.58	5. 4	5.10	5.16	5.22	5.28	5.40	5.51	6. 2	6.27	6.50	7.12	7.32
51.00	4.56	5. 2	5. 8	5.14	5.20	5.26	5.38	5.49	6. 0	6.25	6.48	7.10	7.30
52.00	4.54	5. 0	5. 6	5.12	5.18	5.24	5.36	5.47	5.58	6.23	6.46	7. 8	7.28
53.00	4.53	4.59	5. 5	5.11	5.17	5.23	5.35	5.46	5.57	6.22	6.45	7. 7	7.27
54.00	4.51	4.57	5. 3	5. 9	5.15	5.21	5.33	5.44	5.55	6.20	6.43	7. 5	7.25
55.00	4.50	4.56	5. 2	5. 8	5.14	5.20	5.32	5.43	5.54	6.19	6.42	7. 4	7.24
56.00	4.48	4.54	5. 0	5. 6	5.12	5.13	5.30	5.41	5.52	6.17	6.40	7. 2	7.22
57.00	4.47	4.53	4.59	5. 5	5.11	5.17	5.29	5.40	5.51	6.16	6.39	7. 1	7.21
58.00	4.45	4.51	4.57	5. 3	5. 9	5.15	5.27	5.38	5.49	6.14	6.37	6.59	7.19
59.00	4.44	4.50	4.56	5. 2	5. 8	5.14	5.26	5.37	5.48	6.13	6.36	6.58	7.18
60.00	4.43	4.49	4.55	5. 1	5. 7	5.13	5.25	5.36	5.47	6.12	6.35	6.57	7.17
61 00	4.42	4.48	4.54	5. 0	5. 6	5.12	5.24	5.35	5.46	6.11	6.34	6.56	7.16
62.00	4.40	4.46	4.52	4.58	5. 4	5.10	5.22	5.33	5.41	6. 9	6.32	6.54	7.14
63.00	4.39	4.45	4.51	4.57	5. 3	5. 9	5.21	5.32	5.43	6. 8	6.31	6.53	7.13
64.00	4.38	4.44	4.50	4.56	5. 2	5. 8	5.20	5.31	5.42	6. 7	6.30	6.52	7.12
65.00	4.36	4.42	4.48	4.54	5. 0	5. 6	5.18	5.29	5.40	6. 5	6.28	6.50	7.10
66.00	4.35	4.41	4.47	4.53	4.59	5. 5	5.17	5.28	5.39	6. 4	6.27	6.49	7. 9
67.00	4.34	4.40	4.46	4.52	4.58	5. 4	5.16	5.27	5.38	6. 3	6.26	6.48	7. 8
68.00	4.33	4.39	4.45	4.51	4.57	5. 3	5.15	5.26	5.37	6. 2	6.25	6.47	7. 7
69.00	4.32	4.38	4.44	4.50	4.56	5. 2	5.14	5.25	5.36	6. 1	6.24	6.46	7. 6
71.00	4.29	4.35	4.41	4.47	4.53	4.59	5.11	5.22	5.33	5.58	6.21	6.43	7. 3
73.00	4.27	4.33	4.39	4.45	4.51	4.57	5. 9	5.20	5.31	5.56	6.19	6.41	7. 1
75.00	4 25	4.31	4.37	4.43	4 49	4.55	5. 7	5.18	5.29	5.54	6 17	6.39	6.59
77.00	4.23	4.29	4.35	4.41	4.47	4.53	5. 5	5.16	5.27	5.52	6.15	6.37	6 57
79.00	4.21	4.27	4.33	4.39	4.45	4.51	5. 3	5.14	5.25	5.50	6.13	6.35	6.55
81.00	4.19	4.25	4.31	4.37	4.43	4.49	5. 1	5.12	5.23	5.48	6.11	6.33	6.53
83.00	4.17	4.23	4.29	4.35	4.41	4.47	4.59	5.10	5.21	5.46	6. 9	6.31	6.51
85.00	4.15	4.21	4.27	4.33	4.39	4.45	4.57	5. 8	5.19	5.44	6. 7	6.29	6.49
87.00	4.13	4.19	4.25	4.31	4.37	4.43	4.55	5. 6	5.17	5.42	6. 5	6.27	6.47
90.00	4.10	4.16	4.22	4.28	4.34	4.40	4.52	5. 3	5.14	5.39	6. 2	6.24	6.44

TABLE XXXI.

To reduce the Altitudes of the Heavenly Bodies to the true Altitudes, according to the Spheroidical figure of the Earth.

AZIMUTH FROM THE MERIDIAN.

ARGUMENT LATITUDES.

+00°	00°	18°	26°	32°	37°	41°	45°	49°	53°	57°	60°	63°	66°	70°	73°	76°	79°	81°	84°	90°	Lat.
'	' "	' "	' "	' "	' "	' "	' "	' "	' "	' "	' "	' "	' "	' "	' "	' "	' "	' "	' "		
0	0.00	0.33	0.31	0.30	0.28	0.26	0.24	0.22	0.21	0.19	0.17	0.15	0.13	0.12	0.10	0. 8	0. 6	0. 4	0. 3	00	90
1	0.24	0.55	0.52	0.49	0.46	0.40	0.40	0.37	0.35	0.31	0.28	0.25	0.22	0.20	0.16	0.13	0.10	0. 7	0. 5	00	89
2	0.47	1.17	1.13	1. 9	1. 4	0.54	0.56	0.52	0.49	0.43	0.39	0.35	0.31	0.28	0.22	0.18	0.14	0.10	0. 7	00	88
3	1.10	1.39	1.34	1.29	1.23	1.18	1.12	1. 7	1. 2	0.56	0.51	0.46	0.40	0.35	0.29	0.24	0.19	0.13	0. 8	00	87
4	1.34	2. 1	1.55	1.48	1.41	1.35	1.28	1.22	1.16	1. 9	1. 2	0.56	0.49	0.43	0.36	0.29	0.23	0.16	0.10	00	86
5	1.57	2.23	2.15	2. 8	1.59	1.52	1.44	1.37	1.30	1.22	1.13	1. 6	0.58	0.51	0.43	0.34	0.27	0.19	0.12	00	85
6	2.20	2.45	2.36	2.27	2.18	2. 9	2. 0	1.52	1.43	1.34	1.25	1.16	1. 7	0.58	0.49	0.40	0.31	0.22	0.13	00	84
7	2.43	3. 6	2.56	2.46	2.36	2.26	2.15	2.26	1.56	1.46	1.36	1.26	1.15	1. 5	0.55	0.45	0.35	0.25	0.15	00	83
8	3. 6	3.27	3.16	3. 4	2.54	2.43	2.30	2.20	2. 9	1.58	1.47	1.36	1.23	1.12	1. 1	0.50	0.39	0.28	0.17	00	82
9	3.28	3.48	3.36	3.23	3.11	2.59	2.46	2.34	2 22	2. 9	1.57	1.45	1.32	1.20	1. 8	0.55	0.43	0.31	0.18	00	81
10	3.51	4. 8	3.55	3.41	3.28	3.15	3. 1	2.48	2.35	2.21	2. 7	1.54	1.40	1.27	1.14	1. 0	0.47	0.34	0.20	00	80
11	4.12	4.28	4.14	3.59	3.45	3.31	3.16	3. 2	2.48	2.33	2.17	2. 3	1.48	1.34	1.20	1. 5	0.51	0.37	0.22	00	79
12	4.34	4.49	4.33	4.17	4. 2	3.46	3.30	3.15	3.00	2.44	2.28	2.13	1.57	1.41	1.26	1.10	0.54	0.39	0.23	00	78
13	4.55	5. 8	4.51	4.34	4.18	4. 1	3.44	3.28	3.12	2.55	2.38	2.22	2. 5	1.48	1.32	1.15	0.58	0.41	0.25	00	77
14	5.16	5.27	5.24	4.51	4.34	4.16	3.58	3.41	3.24	3. 6	2.48	2.31	2.13	1.55	1.38	1.19	1. 2	0.43	0.27	00	76
15	5.37	5.47	5.28	5. 9	4.51	4.32	4.13	3.54	3.36	3.17	2.58	2.39	2.21	2. 2	1.43	1.24	1. 6	0.46	0.28	00	75
16	5.57	6. 4	5.38	5.27	5. 8	4.48	4.28	4. 8	3.49	3.29	3. 9	2.48	2.29	2. 9	1.49	1.29	1.10	0.49	0.30	00	74
17	6.17	6.21	5.47	5.45	5.25	5. 4	4.43	4.22	4. 2	3.41	3.20	2.57	2.37	2.16	1.55	1.34	1.14	0.52	0.32	00	73
18	6.36	6.48	6.26	6. 3	5.42	5.20	4.58	4.36	4.14	3.52	3.30	3. 7	2.45	2.24	2. 1	1.39	1.17	0.55	0.33	00	72

ARGUMENT LATITUDES.

																					Lat.
19	6.56	7. 4	6.41	6.18	5.56	5.33	5.10	4.47	4.24	4. 1	3.38	3.15	2.52	2.30	2. 6	1.43	1.20	0.57	0.34	00	71
20	7.13	7.20	6.56	6.33	6.10	5.46	5.22	4.58	4.34	4.10	3.46	3.23	2.59	2.36	2.11	1.47	1.23	0.59	0.35	00	70
21	7.31	7.36	7.12	6.48	6.24	5.59	5.34	5. 9	4.44	4.19	3 54	3 31	3. 6	2.41	2.16	1.51	1.26	1. 1	0.36	00	69
22	7.48	7.52	7.27	7. 1	6.36	6.10	5.44	5.19	4.54	4.28	4. 2	3.37	3.11	2.46	2.20	1.55	1.29	1. 4	0.38	00	68
23	8. 5	8. 6	7.40	7.13	6 48	6.21	5.54	5.28	5. 5	4.38	4.11	3.43	3.17	2.51	2.22	1.58	1.32	1. 5	0.39	00	67
24	8.21	8.20	7.53	7.25	7. 0	6.32	6. 4	5.37	5.10	4.48	4.20	3.49	3.23	2.56	2.24	2. 1	1.35	1. 7	0.40	00	66
25	8.36	8.33	8. 6	7.37	7.12	6.43	6.14	5.46	5.18	4.58	4.29	3.55	3.29	3. 1	2.26	2. 4	1.38	1. 8	0.41	00	65
26	8.52	8.47	8.19	7.50	7.22	6.53	6.25	5.56	5.28	4.59	4.37	4. 2	3.34	3. 5	2.27	2. 8	1.40	1.10	0.43	00	64
27	9. 5	8.59	8.30	8. 1	7.32	7. 3	6.34	6. 4	5.36	5. 6	4.39	4. 8	3.39	3. 9	2.33	2.11	1.42	1.12	0.44	00	63
28	9.19	9.11	8.41	8.12	7.42	7.13	6.43	6.12	5.44	5.13	4.41	4.14	3.44	3.13	2.39	2.14	1.44	1.14	0.45	00	62
29	9.31	9.23	8.53	8.23	7.52	7.23	6.52	6.20	5.51	5.20	4.43	4.20	3.49	3.17	2.45	2.17	1.46	1.16	0.46	00	61
30	9.44	9.35	9. 4	8.33	8. 2	7.31	7. 0	6.29	5.58	5.27	4.45	4.24	3.53	3.22	2.51	2.20	1.49	1.18	0.46	00	60
31	9.55	9.44	9.12	3.41	8. 9	7.38	7. 6	6.35	6. 3	5.32	4.52	4.28	3.57	3.25	2.54	2.22	1.51	1.19	0.47	00	59
32	10. 6	9.53	9.20	8.49	8.16	7.45	7.12	6.41	6. 8	5.37	4.59	4.32	4. 1	3.28	2.57	2.24	1.53	1.20	0.48	00	58
33	10.16	10. 1	9.28	8 57	8.23	7.52	7.18	6.47	6.13	5.42	5. 6	4.36	4. 5	3.31	2.59	2.26	1.55	1.21	0.49	00	57
34	10.27	10. 9	9.36	9. 5	8.30	7.59	7.24	6.53	6.18	5.47	5.13	4.40	4. 9	3.34	3. 2	2.28	1. 5	1.23	0.50	00	56
35	10.32	10.18	9.45	9.11	8.38	8. 4	7.31	6.58	6.25	5.51	5.18	4.44	4.11	3.37	3. 4	2.30	1.57	1.24	0.50	00	55
36	10.41	10.27	9.54	9.20	8.47	8.13	7.40	7. 7	6.34	6. 0	5.27	4.53	4.20	3.46	3.13	2.39	2. 6	1.33	0.59	00	54
37	10.48	10.34	10. 1	9.27	8.54	8.20	7.47	7.14	6.41	6. 7	5.34	5. 0	4.27	3.53	3.20	2.46	2.13	1.40	1. 6	00	53
38	10.54	10.40	10. 7	9.33	9. 0	8.26	7.53	7.20	6.47	6.13	5.40	5. 6	4.33	3.59	3.26	2.52	2.19	1.46	1.12	00	52
39	10.59	10.45	10.18	9.38	9. 5	8.31	7.58	7.25	6.52	6.18	5.45	5.11	4.38	4. 4	3.31	2.57	2.24	1.51	1.17	00	51
40	11. 4	10 50	10.17	9.43	9.10	8.36	8. 3	7.30	6.57	6.23	5.50	5.16	4.42	4. 9	3.36	3. 2	2.29	1.56	1.22	00	50
41	11. 7	10.53	10.20	9.46	9.13	8.39	8. 6	7.33	7. 0	6.26	5.58	5.19	4.45	4.12	3.39	3. 5	2.32	1.59	1.25	00	49
42	11.10	10.56	10 23	9.49	9.16	8.42	8. 9	7.36	7. 3	6.29	6. 1	5 22	4.48	4.15	3.42	3. 8	2.35	2. 2	1.28	00	48
43	11.12	10.58	10.25	9.51	9.18	8.44	8.11	7.38	7. 5	6.31	6. 3	5.24	4.50	4.17	3.44	3.10	2.37	2. 4	1.30	00	47
44	11.13	10.59	10.26	9.52	9.19	8.45	8.12	7.39	7. 6	6.32	6. 4	5.25	4.51	4.18	3.45	3.11	2.38	2. 5	1.31	00	46
45	11.14	11.00	10.27	9.53	9.20	8.46	8.13	7.40	7. 7	6.33	6. 5	5.26	4.52	4.19	3.46	3.12	2.38	2. 6	1.32	00	45
+		162	154	148	143	139	135	131	127	123	120	117	114	110	107	104	101	99	96	90	−

Azimuth from the Meridian.

TABLE XXXII.—SUN'S DECLIN. for the Years 1831, 1835, 1839, 1843, &c.

Days.	Jan. South	Feb. South	March South	April North	May North	June North	July North	Aug. North	Sept. North	Oct. South	Nov. South	Dec. South	Days.
	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	
1	23 3	17 13	7 45	4 22	14 56	22 0	23 10	18 10	8 29	3 0	14 18	21 45	1
2	22 58	16 56	7 22	4 45	15 14	22 8	23 6	17 55	8 7	3 23	14 37	21 55	2
3	22 53	16 39	6 59	5 8	15 32	22 16	23 1	17 40	7 45	3 46	14 56	22 3	3
4	22 47	16 21	6 36	5 31	15 50	22 23	22 57	17 24	7 23	4 10	15 15	22 12	4
5	22 40	16 3	6 13	5 54	16 7	22 30	22 51	17 8	7 1	4 33	15 33	22 20	5
6	22 34	15 45	5 50	6 17	16 21	22 37	22 46	16 52	6 39	4 56	15 51	22 28	6
7	22 26	15 26	5 27	6 39	16 41	22 43	22 40	16 35	6 16	5 19	16 9	22 35	7
8	22 19	15 7	5 3	7 2	16 57	22 49	22 33	16 19	5 54	5 42	16 27	22 42	8
9	22 10	14 48	4 40	7 24	17 14	22 54	22 27	16 2	5 31	6 5	16 45	22 48	0
10	22 2	14 29	4 17	7 46	17 30	22 59	22 19	15 44	5 8	6 28	17 2	22 54	10
11	21 53	14 10	3 53	8 9	17 45	23 4	22 12	15 27	4 46	6 51	17 19	22 59	11
12	21 43	13 50	3 29	8 31	18 1	23 8	22 4	15 9	4 23	7 13	17 35	23 4	12
13	21 33	13 30	3 6	8 53	18 16	23 12	21 56	14 51	4 0	7 36	17 52	23 8	13
14	21 23	13 10	2 42	9 14	18 31	23 15	21 47	14 33	3 37	7 58	18 8	23 12	14
15	21 12	12 49	2 19	9 36	18 45	23 18	21 38	14 14	3 11	8 21	18 23	23 16	15
16	21 1	12 29	1 55	9 57	18 59	23 21	21 28	13 55	2 51	8 43	18 39	23 19	16
17	20 50	12 8	1 31	10 19	19 13	23 23	21 19	13 36	2 27	9 5	18 53	23 22	17
18	20 38	11 47	1 8	10 40	19 27	23 25	21 8	13 17	2 4	9 27	19 8	23 24	18
19	20 26	11 26	0 44	11 1	19 40	23 26	20 58	12 58	1 41	0 49	19 22	23 25	19
20	20 13	11	0 20S	11 21	19 53	23 27	20 47	12 38	1 18	10 11	19 36	23 27	20
21	20 0	10 43	0 4N	11 42	20 5	23 27	20 36	12 18	0 54	10 32	19 50	23 27	21
22	19 47	10 21	0 27	12 2	20 18	23 28	20 24	11 58	0 31	10 54	20 3	23 28	22
23	19 33	9 59	0 51	12 22	20 29	23 27	20 12	11 38	0 8N	11 15	20 16	23 27	23
24	19 19	9 37	1 15	12 42	20 41	23 27	20 0	11 18	0 16S	11 36	20 29	23 27	24
25	19 4	9 15	1 38	13 2	20 52	23 25	19 47	10 57	0 39	11 57	20 41	23 26	25
26	18 49	8 53	2 2	13 22	21 3	23 24	19 35	10 37	1 3	12 17	20 53	23 24	26
27	18 34	8 30	2 25	13 41	21 13	23 22	19 21	10 16	1 26	12 38	21 4	23 22	27
28	18 19	8 8	2 49	14 0	21 23	23 19	19 8	9 55	1 49	12 58	21 15	23 19	28
29	18 3		3 12	14 19	21 33	23 17	18 51	9 33	2 13	13 18	21 25	23 16	29
30	17 47		3 35	14 37	21 42	23 13	18 40	9 12	2 36	13 38	21 36	23 13	30
31	17 3		3 59		21 51		18 25	8 51		13 58		23 9	31
SUN'S DECLINATION for the Years 1832, 1836, 1840, 1844, &c.													
1	23 4	17 17	7 28	4 46	15 10	22 6	23 7	17 59	8 12	3 17	14 32	21 52	1
2	22 59	17 0	7 5	5 3	15 26	22 14	23 3	17 44	7 51	3 41	14 51	22 1	2
3	22 54	16 43	6 42	5 26	15 45	22 21	22 58	17 28	7 28	4 4	15 10	22 10	3
4	22 48	16 25	6 19	5 48	16 3	22 28	22 53	17 12	7 6	4 27	15 29	22 18	4
5	22 42	16 7	5 55	6 11	16 20	22 35	22 47	16 56	6 44	4 50	15 47	22 26	5
6	22 35	15 49	5 32	6 34	16 37	22 42	22 41	16 39	6 22	5 13	16 5	22 33	6
7	22 28	15 31	5 9	6 56	16 54	22 47	22 35	16 23	5 59	5 36	16 23	22 40	7
8	22 20	15 12	4 46	7 19	17 10	22 53	22 28	16 6	5 37	5 59	16 40	22 46	8
9	22 12	14 53	4 22	7 41	17 26	22 58	22 21	15 49	5 14	6 22	16 58	22 52	9
10	22 4	14 34	3 59	8 3	17 42	23 3	22 14	15 31	4 51	6 45	17 15	22 58	10
11	21 55	14 14	3 35	8 25	17 57	23 7	22 6	15 13	4 28	7 8	17 31	23 3	11
12	21 46	13 55	3 12	8 47	18 12	23 11	21 58	14 55	4 6	7 32	17 48	23 7	12
13	21 36	13 35	2 48	9 9	18 27	23 14	21 49	14 37	3 43	7 53	18 4	23 11	13
14	21 26	13 15	2 24	9 31	18 42	23 18	21 40	14 19	3 20	8 15	18 19	23 15	14
15	21 15	12 54	2 1	9 52	18 56	23 20	21 31	14 0	2 56	8 37	18 35	23 18	15
16	21 4	12 34	1 37	10 14	19 10	23 22	21 21	13 41	2 33	9 0	18 50	23 21	16
17	20 53	12 13	1 13	10 35	19 24	23 24	21 11	13 22	2 10	9 22	19 5	23 23	17
18	20 41	11 52	0 50	10 56	19 37	23 26	21 1	13 3	1 47	9 43	19 19	23 25	18
19	20 29	11 31	0 26	11 16	19 50	23 27	20 50	12 43	1 23	10 5	19 33	33 26	19
20	20 16	11 9	0 2S	11 37	20 2	23 27	20 39	12 23	1 0	10 27	19 47	23 27	20
21	20 3	10 48	0 22N	11 57	20 15	23 28	20 27	12 3	0 37	10 48	20 0	23 28	21
22	19 50	10 26	0 45	12 18	20 27	23 27	20 15	11 43	0 13N	11 10	20 13	23 28	22
23	19 36	10 4	1 9	12 38	20 38	23 27	20 3	11 23	0 10S	11 31	20 26	23 27	23
24	19 22	9 42	1 32	12 57	20 49	23 26	19 51	11 2	0 34	11 52	20 38	23 26	24
25	19 8	9 20	1 56	13 17	21 0	23 24	19 30	10 42	0 57	12 12	20 50	23 24	25
26	18 53	8 58	2 20	13 36	21 11	23 22	19 25	10 21	1 20	12 33	21 1	23 22	26
27	18 38	8 36	2 43	13 55	21 21	23 20	19 11	10 0	1 44	12 53	21 12	23 20	27
28	18 22	8 13	3 6	14 14	21 31	23 17	18 57	9 39	2 7	13 14	21 23	23 17	28
29	18 7	7 50	3 30	14 33	21 40	23 14	18 43	9 17	2 31	13 34	21 33	23 14	29
30	17 51		3 53	14 52	21 49	23 11	18 29	8 56	2 54	13 53	21 43	23 10	30
31	17 34		4 16		21 58		18 14	8 34		14 13		23 5	31

TABLE XXXII.—SUN'S DECLIN. for the Years 1833, 1837, 1841, 1845, &c.

Days	Jan South	Feb. South	March South	April North	May North	June North	July North	Aug. North	Sept. North	Oct. South	Nov. South	Dec. South	Days
	°	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	
1	23 1	17 5	7 33	4 34	15 5	22 4	23 8	18 3	8 18	3 12	14 28	21 50	1
2	22 55	16 47	7 10	4 57	15 23	22 12	23 4	17 47	7 56	3 35	14 47	21 59	2
3	22 50	16 30	6 47	5 20	15 41	22 20	22 59	17 32	7 34	3 58	15 6	22 8	3
4	22 44	16 12	6 24	5 43	15 59	22 27	22 54	17 16	7 12	4 21	15 24	22 16	4
5	22 37	15 54	6 1	6 6	16 16	22 31	22 49	17 0	6 50	4 45	15 43	22 24	5
6	22 30	15 35	5 38	6 28	16 33	22 40	22 43	16 44	6 27	5 8	16 1	22 31	6
7	22 22	15 17	5 15	6 51	16 49	22 46	22 37	16 27	6 5	5 31	16 19	22 38	7
8	22 14	14 58	4 51	7 13	17 6	22 52	22 30	16 10	5 42	5 54	16 36	22 45	8
9	22 6	14 39	4 28	7 36	17 22	22 57	22 23	15 53	5 20	6 17	16 54	22 51	9
10	21 57	14 19	4 5	7 58	17 38	23 2	22 16	15 35	4 57	6 40	17 11	22 57	10
11	21 48	14 0	3 41	8 20	17 53	23 6	22 8	15 18	4 34	7 2	17 27	23 2	11
12	21 38	13 40	3 17	8 42	18 9	23 10	22 0	15 0	4 11	7 25	17 44	23 6	12
13	21 28	13 20	2 54	9 4	18 24	23 14	21 51	14 42	3 48	7 47	18 0	23 11	13
14	21 18	12 59	2 30	9 25	18 38	23 17	21 42	14 23	3 25	8 10	18 16	23 14	14
15	21 7	12 39	2 7	9 47	18 53	23 20	21 33	14 5	3 2	8 32	18 31	23 18	15
16	20 56	12 18	1 43	10 8	19 7	23 22	21 24	13 46	2 39	8 54	18 46	23 20	16
17	20 44	11 57	1 19	10 29	19 20	23 24	21 14	13 27	2 16	9 16	19 1	23 23	17
18	20 32	11 36	0 55	10 50	19 34	23 25	21 3	13 7	1 52	9 38	19 16	23 25	18
19	20 19	11 15	0 32	11 11	19 47	23 27	20 52	12 48	1 29	10 0	19 30	23 26	19
20	20 6	10 53	0 8 S	11 32	19 59	23 27	20 41	12 28	1 6	10 22	19 44	23 27	20
21	19 53	10 32	0 16N	11 52	20 12	23 28	20 30	12 8	0 42	10 43	19 57	23 28	21
22	19 40	10 10	0 39	12 13	20 24	23 28	20 18	11 48	0 19N	11 5	20 10	23 28	22
23	19 26	9 48	1 3	12 33	20 35	23 27	20 6	11 28	0 5 S	11 26	20 23	23 27	23
24	19 11	9 26	1 27	12 53	20 47	23 26	19 54	11 7	0 28	11 47	20 35	23 26	24
25	18 57	9 3	1 50	13 12	20 58	23 25	19 41	10 47	0 51	12 8	20 47	23 25	25
26	18 42	8 41	2 14	13 32	21 8	23 23	19 28	10 26	1 15	12 28	20 59	23 23	26
27	18 26	8 19	2 37	13 51	21 19	23 21	19 14	10 5	1 38	12 49	21 10	23 21	27
28	18 11	7 56	3 1	14 10	21 28	23 18	19 1	9 44	2 2	13 9	21 20	23 18	28
29	17 54		3 24	14 29	21 38	23 15	18 47	9 22	2 25	13 29	21 31	23 15	29
30	17 38		3 47	14 47	21 47	23 12	18 32	9 1	2 48	13 49	21 41	23 11	30
31	17 21		4 11		21 56		18 18	8 39		14 8		23 7	31

SUN'S DECLINATION for the Years 1834, 1838, 1842, 1846, &c.

1	23 2	17 8	7 38	4 28	15 1	22 2	23 9	18 6	8 23	3 6	14 23	21 48	1
2	22 57	16 51	7 16	4 51	15 19	22 10	23 5	7 51	8 1	3 29	14 42	21 57	2
3	22 51	16 34	6 53	5 14	15 37	22 18	23 0	17 36	7 39	3 53	15 1	22 6	3
4	22 45	16 16	6 30	5 37	15 54	22 25	22 55	17 20	7 17	4 16	15 20	22 14	4
5	22 39	15 58	6 7	6 00	16 12	22 32	22 50	17 4	6 55	4 39	15 38	22 22	5
6	22 32	15 40	5 43	6 23	16 29	22 38	22 44	16 47	6 33	5 2	15 56	22 30	6
7	22 24	15 21	5 20	6 46	16 45	22 45	22 38	16 31	6 10	5 25	16 14	22 37	7
8	22 16	15 2	4 57	7 8	17 2	22 50	22 32	16 14	5 48	5 48	16 32	22 43	8
9	22 8	14 43	4 33	7 30	17 18	22 56	22 25	15 57	5 25	6 11	16 49	22 49	9
10	21 59	14 24	4 10	7 53	17 34	23 0	22 17	15 40	5 2	6 34	17 6	22 55	10
11	21 50	14 4	3 47	8 15	17 50	23 5	22 10	15 22	4 39	6 57	17 23	23 0	11
12	21 41	13 44	3 23	8 37	18 5	23 9	22 2	15 4	4 17	7 19	17 40	23 5	12
13	21 31	13 24	2 59	8 59	18 20	23 13	21 53	14 46	3 54	7 42	17 56	23 9	13
14	21 20	13 4	2 36	9 20	18 35	23 16	21 44	14 28	3 31	8 4	18 12	23 13	14
15	21 9	12 44	2 12	9 42	18 49	23 19	21 35	14 9	3 8	8 27	18 27	23 17	15
16	20 58	12 23	1 48	10 3	19 3	23 21	21 26	13 50	2 44	8 49	18 43	23 20	16
17	20 47	12 2	1 25	10 24	19 17	23 23	21 16	13 31	2 21	9 11	18 57	23 22	17
18	20 35	11 41	1 1	10 45	19 30	23 25	21 6	13 12	1 58	9 33	19 12	23 24	18
19	20 22	11 20	0 37	11 6	19 44	23 26	20 55	12 52	1 35	9 55	19 26	23 26	19
20	20 9	10 58	0 14 S	11 27	19 56	23 27	20 44	12 33	1 11	10 16	19 40	23 27	20
21	19 56	10 37	0 10N	11 47	20 9	23 28	20 33	12 13	0 48	10 38	19 54	23 27	21
22	19 43	10 15	0 34	12 8	20 21	23 27	20 21	11 53	0 25	10 59	20 7	23 28	22
23	19 29	9 53	0 57	12 28	20 33	23 27	20 9	11 33	0 1N	11 21	20 20	23 27	23
24	19 15	9 31	1 21	12 48	20 44	23 26	19 57	11 12	0 22 S	11 42	20 32	23 26	24
25	19 0	9 9	1 44	13 7	20 55	23 25	19 44	10 52	0 46	12 2	20 44	23 25	25
26	18 45	8 46	2 8	13 27	21 6	23 23	19 31	10 31	1 9	12 23	20 56	23 23	26
27	18 30	8 24	2 31	13 46	21 16	23 21	19 18	10 10	1 33	12 44	21 7	23 31	27
28	18 14	8 1	2 55	14 5	21 26	23 19	19 4	9 49	1 56	13 4	21 18	23 18	28
29	17 58		3 19	14 24	21 36	23 16	18 50	9 27	2 19	13 24	21 28	23 15	29
30	17 42		3 42	14 43	21 45	23 13	18 36	9 6	2 43	13 44	21 38	23 12	30
31	17 25		4 5		21 54		18 21	8 45		14 4		23 8	31

TABLE XXXIII.

To correct the Sun's Declination for the changes in periods of Four Y

Periods of Years.	MONTHS.														
	January.					February.					March.				
	Days.					Days.					Days.				
	1	7	13	19	25	1	7	13	19	25	1	7	13	19	25
	sub.	sub.	sub.	sub.	sub.	sub.	sub.	sub.	sub.	sub.	sub.	sub.	sub.	sub	add.
	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′
4	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
8	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1
12	0	1	1	1	1	1	2	2	2	2	2	2	2	2	2
16	1	1	1	1	2	2	2	2	2	3	3	3	3	3	3
20	1	1	1	2	2	2	3	3	3	3	3	3	3	4	4
	April.					May.					June.				
	Days.					Days.					Days.				
	1	7	13	19	25	1	7	13	19	25	1	7	13	19	25
	add.	add.	add.	add.	add.	add.	add.	add.	add.	add.	add.	add.	add.		
	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′
4	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0
8	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0
12	2	2	2	2	2	2	2	1	1	1	1	1	0	0	0
16	3	3	3	3	2	2	2	2	1	1	1	1	0	0	0
20	3	3	3	3	3	3	3	2	2	2	1	1	1	0	0
	July.					August.					September.				
	Days.					Days.					Days.				
	1	7	13	19	25	1	7	13	19	25	1	7	13	19	25
	add.	sub.	sub.	sub	sub.	sub.	sub.	sub.	sub.	sub.	sub.	sub.	sub.	sub.	add.
	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′
4	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
8	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1
12	0	1	1	1	1	1	2	2	2	2	2	2	2	2	2
16	0	1	1	1	2	2	2	2	2	3	3	3	3	3	3
20	1	1	1	2	2	2	2	3	3	3	3	3	3	4	4
	October.					November.					December.				
	Days.					Days.					Days.				
	1	7	13	19	25	1	7	13	19	25	1	7	13	19	25
	add.	add.	add.	add.	add.	add.	add.	add.	add.	add.	add	add.	add.		
	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′
4	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0
8	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0
12	2	2	2	2	2	2	2	1	1	1	1	1	0	0	0
16	3	3	3	3	2	2	2	2	2	1	1	1	0	0	0
20	3	3	3	3	3	3	3	2	2	2	2	1	1	0	0

TABLE XXXIV.

To reduce the Moon's Horizontal Parallax and Semidiameter to any Time under the Meridian of Greenwich.

Diff. in 12 hrs	Reduced Time after Noon or Midnight.																Diff. in 12 hrs.
	h m 0 10	h m 0 20	h m 0 30	h m 0 40	h m 0 50	h m 1 0	h m 2 0	h m 3 0	h m 4 0	h m 5 0	h m 6 0	h m 7 0	h m 8 0	h m 9 0	h m 10 0	h m 11 0	
1″	0″	0″	0″	0″	0″	0″	0″	0″	0″	0″	0″	1″	1″	1″	1″	1″	1″
2	0	0	0	0	0	0	0	0	1	1	1	1	1	2	2	2	2
3	0	0	0	0	0	0	0	1	1	1	1	2	2	2	3	3	3
4	0	0	0	0	0	0	1	1	1	2	2	2	3	3	3	4	4
5	0	0	0	0	0	0	1	1	2	2	2	3	3	4	4	5	5
6	0	0	0	0	0	0	1	1	2	2	3	3	4	5	5	6	6
7	0	0	0	0	0	1	1	2	2	3	3	4	5	5	6	6	7
8	0	0	0	0	1	1	1	2	3	3	4	5	5	6	7	7	8
9	0	0	0	0	1	1	1	2	3	4	4	5	6	7	8	8	9
10	0	0	0	1	1	1	2	2	3	4	5	6	7	8	8	9	10
11	0	0	0	1	1	1	2	3	4	5	5	6	7	8	9	10	11
12	0	0	0	1	1	1	2	3	4	5	6	7	8	9	10	11	12
13	0	0	1	1	1	1	2	3	4	5	6	8	9	10	11	12	13
14	0	0	1	1	1	1	2	3	5	6	7	8	9	11	12	13	14
15	0	0	1	1	1	1	2	4	5	6	7	9	10	11	13	14	15
16	0	0	1	1	1	1	3	4	5	7	8	9	11	12	13	15	16
17	0	0	1	1	1	1	3	4	6	7	8	10	11	13	14	16	17
18	0	0	1	1	1	1	3	4	6	7	9	11	12	14	15	17	18
19	0	1	1	1	1	2	3	5	6	8	9	11	13	14	16	17	19
20	0	1	1	1	1	2	3	5	7	8	10	12	13	15	17	18	20
21	0	1	1	1	2	2	3	5	7	9	10	12	14	16	18	19	21
22	0	1	1	1	2	2	4	5	7	9	11	13	15	17	18	20	22
23	0	1	1	1	2	2	4	6	8	10	11	13	15	17	19	21	23
24	0	1	1	1	2	2	4	6	8	10	12	14	16	18	20	22	24
25	0	1	1	1	2	2	4	6	8	10	12	15	17	19	21	23	25
26	0	1	1	1	2	2	4	6	9	11	13	15	17	20	22	24	26
27	0	1	1	1	2	2	4	7	9	11	13	16	18	20	23	25	27
28	0	1	1	2	2	2	5	7	9	12	14	16	19	21	23	26	28
29	0	1	1	2	2	2	5	7	10	12	14	17	19	22	24	27	29
30	0	1	1	2	2	2	5	7	10	12	15	17	20	23	25	28	30
31	0	1	1	2	2	3	5	8	10	13	15	18	21	23	26	28	31
32	0	1	1	2	2	3	5	8	11	13	16	19	21	24	27	29	32
33	0	1	1	2	2	3	5	8	11	14	16	19	22	25	28	30	33
34	0	1	1	2	2	3	6	8	11	14	17	20	22	26	28	31	34
35	0	1	1	2	2	3	6	9	12	15	17	20	23	26	29	32	35
36	0	1	2	2	2	3	6	9	12	15	18	21	24	27	30	33	36
37	1	1	2	2	3	3	6	9	12	15	18	22	25	28	31	34	37
38	1	1	2	2	3	3	6	9	13	16	19	22	25	29	32	35	38
39	1	1	2	2	3	3	6	10	13	16	19	23	26	29	33	36	39
40	1	1	2	2	3	3	7	10	13	17	20	23	27	30	33	37	40
41	1	1	2	2	3	3	7	10	14	17	20	24	27	31	34	38	41
42	1	1	2	2	3	3	7	10	14	17	21	25	28	32	35	39	42
43	1	1	2	2	3	4	7	11	14	18	21	25	29	32	36	40	43
44	1	1	2	2	3	4	7	11	15	18	22	26	29	33	37	40	44
45	1	1	2	2	3	4	7	11	15	19	22	26	30	34	38	41	45
46	1	1	2	3	3	4	8	11	15	19	23	27	31	35	38	42	46
47	1	1	2	3	3	4	8	12	16	19	23	27	31	35	39	43	47
48	1	1	2	3	3	4	8	12	16	20	24	28	32	36	40	44	48
49	1	1	2	3	3	4	8	12	16	20	24	29	33	37	41	45	49
50	1	1	2	3	4	4	8	12	17	21	25	29	33	38	42	46	50
51	1	1	2	3	4	4	8	13	17	21	25	30	34	38	43	47	51
52	1	1	2	3	4	4	9	13	17	22	26	30	35	39	43	48	52
53	1	1	2	3	4	4	9	13	18	22	26	31	35	40	44	49	53
54	1	2	2	3	4	4	9	13	18	22	27	32	36	41	45	50	54
55	1	2	2	3	4	5	9	14	18	23	27	32	37	42	46	50	55
56	1	2	2	3	4	5	9	14	19	23	28	33	37	42	47	51	56
57	1	2	2	3	4	5	9	14	19	24	28	33	38	43	48	52	57
58	1	2	2	3	4	5	10	14	19	24	29	34	39	44	48	53	58
59	1	2	2	3	4	5	10	15	20	25	29	34	39	44	49	54	59
60	1	2	2	3	4	5	10	15	20	25	30	35	40	45	50	55	60

TABLE XXXV.

LUNI-SOLAR TABLE,

For clearing the Angular Distance between the Sun, Moon, and Stars
the effect of Refraction and Parallax.

	Moon's Apparent Altitude.						Moon's Apparent Altitude				
	4°						5°				
h. p.	00′	10′	20′	30′	40′	50	00′	10′	20′	30′	40
′ ″											
53.00	300758	300739	300719	300700	300680	300660	300642	300622	300604	300584	3005
10	0756	0737	0717	0698	0678	0658	0640	0620	0601	0582	05
20	0754	0735	0715	0696	0676	0656	0638	0618	0599	0580	05
30	0752	0733	0713	0694	0674	0654	0636	0616	0597	0577	05
40	0750	0731	0711	0692	0672	0652	0634	0614	0595	0575	05
50	0748	0729	0709	0690	0670	0650	0632	0612	0593	0573	05
54.00	300746	300727	300707	300688	300668	300648	300629	300609	300590	300570	3005
10	0744	0725	0705	0686	0666	0646	0627	0607	0588	0568	05
20	0742	0723	0703	0684	0664	0644	0625	0604	0586	0566	05
30	0740	0721	0701	0682	0662	0642	0623	0602	0583	0563	05
40	0738	0719	0699	0680	0660	0640	0621	0600	0581	0561	05
50	0737	0717	0697	0678	0658	0638	0619	0598	0579	0559	05
55.00	300736	300716	300696	300676	300656	300636	300617	300596	300576	300556	3005
10	0734	0714	0694	0674	0654	0634	0615	0593	0574	0554	05
20	0732	0712	0692	0672	0652	0632	0613	0591	0571	0551	05
30	0730	0710	0690	0670	0650	0630	0610	0589	0569	0549	05
40	0728	0708	0688	0668	0648	0628	0608	0587	0567	0547	05
50	0716	0706	0686	0666	0646	0626	0606	0585	0565	0545	05
56.00	300725	300705	300685	300664	300644	300624	300604	300583	300563	300543	3005
10	0723	0703	0683	0662	0642	0622	0602	0581	0560	0540	05
20	0721	0701	0681	0660	0640	0620	0600	0579	0558	0538	05
30	0719	0699	0679	0658	0638	0618	0597	0577	0556	0536	05
40	0717	0697	0677	0656	0636	0615	0595	0575	0554	0534	05
50	0716	0695	0675	0654	0634	0613	0593	0573	0551	0531	05
57.00	300715	300694	300674	300653	300632	300611	300591	300570	300549	300529	3005
10	0713	0692	0672	0651	0630	0609	0589	0568	0546	0526	05
20	0711	0690	0670	0649	0628	0607	0587	0566	0544	0524	050
30	0710	0688	0668	0647	0626	0605	0585	0564	0542	0522	049
40	0708	0687	0666	0645	0624	0603	0583	0561	0540	0519	049
50	0706	0685	0664	0643	0622	0601	0581	0559	0538	0517	049
58.00	300705	300684	300663	300641	300620	300599	300579	300557	300536	300515	30049
10	0703	0682	0661	0639	0618	0596	0576	0554	0533	0512	049
20	0701	0680	0659	0637	0616	0594	0574	0552	0531	0510	048
30	0700	0678	0657	0635	0614	0592	0572	0550	0529	0508	048
40	0698	0676	0655	0633	0612	0590	0570	0548	0526	0505	048
50	0696	0674	0653	0631	0610	0588	0568	0546	0524	0503	048
59.00	300694	300673	300651	300629	300607	300586	300566	300544	300522	300501	30047
10	0692	0671	0649	0627	0605	0584	0563	0541	0520	0498	047
20	0690	0669	0647	0625	0603	0582	0561	0539	0517	0496	047
30	0688	0667	0645	0623	0601	0580	0559	0537	0515	0494	047
40	0686	0665	0643	0621	0600	0578	0557	0534	0513	0491	047
50	0684	0663	0642	0619	0598	0576	0555	0532	0511	0489	046
60.00	300683	300662	300640	300618	300596	300574	300553	300531	300509	300487	30046
10	0681	0660	0639	0616	0594	0572	0550	0528	0506	0484	046
20	0679	0658	0636	0614	0592	0570	0548	0526	0504	0482	046
30	0677	0656	0634	0612	0590	0568	0546	0524	0502	0480	045
40	0675	0654	0632	0610	0588	0566	0544	0522	0500	0477	045
50	0674	0652	0630	0608	0586	0564	0542	0520	0498	0475	045
61.00	300673	300651	300628	300606	300584	300562	300540	300518	300495	300473	30045
10	0671	0649	0626	0604	0582	0560	0538	0515	0492	0470	044
20	0669	0647	0624	0602	0580	0558	0535	0513	0490	0468	044
30	0667	0645	0622	0600	0578	0556	0533	0511	0488	0466	044
40	0665	0643	0620	0598	0576	0554	0531	0509	0486	0464	044
50	0664	0641	0618	0596	0574	0552	0529	0507	0484	0461	043

TABLE XXXV.

LUNI-SOLAR TABLE,

For clearing the Angular Distance between the Sun, Moon, and Stars, from the effect of Refraction and Parallax.

	Moon's Apparent Altitude.						Moon's Apparent Altitude.					
	6°						7°					
h. p.	00′	10′	20′	30′	40′	50′	00′	10′	20′	30′	40′	50′
′ ″												
53.00	300527	300507	300487	300469	300449	300429	300411	300391	300371	300351	300331	300313
10	0524	0504	0484	0466	0446	0426	0408	0388	0368	0348	0328	0310
20	0520	0501	0481	0463	0443	0423	0405	0385	0365	0345	0325	0307
30	0518	0498	0479	0460	0441	0421	0402	0382	0362	0342	0322	0304
40	0516	0496	0476	0457	0438	0418	0399	0379	0359	0339	0319	0300
50	0514	0494	0474	0454	0435	0415	0396	0376	0356	0336	0316	0297
54.00	300511	300491	300471	300451	300432	300412	300393	300373	300353	300333	300313	300294
10	0508	0488	0468	0448	0429	0409	0390	0370	0350	0330	0310	0291
20	0506	0486	0466	0445	0426	0406	0387	0367	0347	0327	0307	0288
30	0503	0483	0463	0442	0423	0403	0384	0364	0344	0324	0304	0284
40	0501	0481	0461	0440	0421	0401	0381	0361	0341	0321	0301	0281
50	0498	0478	0458	0437	0418	0398	0378	0358	0338	0318	0298	0278
55.00	300496	300476	300456	300435	300415	300395	300375	300355	300335	300315	300295	300275
10	0493	0473	0453	0432	0412	0392	0372	0352	0332	0312	0292	0272
20	0491	0471	0451	0430	0410	0389	0369	0349	0329	0309	0289	0269
30	0488	0468	0448	0427	0407	0386	0366	0346	0326	0305	0285	0265
40	0485	0465	0445	0424	0404	0384	0364	0344	0323	0302	0282	0262
50	0483	0463	0443	0422	0402	0381	0361	0341	0320	0299	0279	0259
56.00	300481	300460	300440	300419	300399	300378	300358	300338	300317	300296	300276	300256
10	0478	0457	0437	0416	0396	0375	0355	0335	0314	0293	0273	0253
20	0476	0455	0435	0413	0393	0372	0353	0333	0311	0290	0270	0250
30	0473	0452	0432	0410	0390	0369	0350	0330	0308	0286	0266	0246
40	0471	0450	0429	0408	0388	0367	0347	0327	0305	0283	0263	0243
50	0468	0447	0427	0405	0385	0364	0344	0325	0302	0280	0260	0240
57.00	300466	300445	300424	300403	300382	300361	300341	300321	300299	300278	300257	300237
10	0463	0442	0421	0400	0379	0358	0339	0319	0296	0275	0254	0234
20	0461	0440	0419	0398	0377	0356	0335	0315	0293	0272	0251	0231
30	0458	0437	0416	0395	0374	0353	0332	0312	0290	0269	0248	0227
40	0456	0435	0414	0392	0371	0350	0329	0309	0287	0266	0245	0224
50	0453	0432	0411	0390	0369	0348	0326	0305	0284	0263	0242	0221
58.00	300451	300430	300409	300387	300366	300345	300324	300302	300281	300260	300239	300218
10	0448	0427	0406	0384	0363	0342	0321	0299	0278	0257	0236	0215
20	0446	0425	0404	0381	0360	0339	0318	0296	0275	0254	0233	0212
30	0443	0422	0401	0378	0357	0336	0315	0293	0272	0250	0229	0208
40	0441	0420	0398	0376	0355	0334	0313	0291	0269	0247	0226	0205
50	0438	0417	0396	0373	0352	0331	0310	0288	0266	0244	0223	0202
59.00	300436	300415	300393	300371	300349	300328	300307	300285	300263	300241	300220	300199
10	0433	0412	0390	0368	0346	0325	0304	0282	0260	0238	0217	0196
20	0431	0410	0388	0366	0344	0322	0301	0279	0257	0235	0214	0192
30	0428	0407	0385	0363	0341	0319	0298	0276	0254	0231	0210	0189
40	0425	0404	0382	0360	0338	0317	0295	0273	0251	0228	0207	0186
50	0423	0402	0380	0357	0335	0314	0292	0270	0248	0225	0204	0182
60.00	300421	300399	300377	300355	300333	300311	300289	300267	300245	300223	300201	300179
10	0418	0396	0374	0352	0330	0308	0287	0265	0242	0220	0198	0176
20	0416	0394	0372	0349	0327	0305	0285	0263	0239	0217	0195	0173
30	0413	0391	0369	0346	0324	0302	0282	0260	0236	0213	0191	0169
40	0411	0389	0366	0344	0322	0300	0279	0257	0233	0210	0188	0166
50	0408	0386	0364	0341	0319	0297	0276	0254	0230	0207	0185	0163
61.00	300406	300384	300361	300339	300316	300294	300272	300249	300227	300205	300182	300160
10	0403	0381	0358	0336	0313	0291	0269	0246	0224	0202	0179	0157
20	0401	0379	0356	0333	0310	0288	0266	0243	0221	0199	0176	0154
30	0398	0376	0353	0330	0307	0285	0263	0240	0218	0195	0172	0151
40	0396	0373	0350	0328	0305	0283	0260	0237	0215	0192	0169	0147
50	0393	0371	0348	0325	0302	0280	0257	0234	0212	0189	0166	0144

TABLE XXXV.

LUNI-SOLAR TABLE,

For clearing the Angular Distance between the Sun, Moon, and Stars, from the effect of Refraction and Parallax.

	Moon's Apparent Altitude.						Moon's Apparent Altitude.					
	8°						9°					
h. p.	00′	10	20	30′	40′	50′	00′	10′	20′	30′	40′	50′
′ ″												
53.00	300295	300275	300255	300237	300218	300198	300178	300158	300138	300119	300099	[illegible]
10	0291	0272	0252	0233	0214	0194	0174	0154	0134	0115	0095	[illegible]
20	0287	0268	0248	0229	0210	0190	0170	0150	0130	0111	0091	0071
30	0284	0265	0245	0226	0207	0187	0167	0147	0127	0108	0088	[illegible]
40	0281	0262	0242	0222	0203	0183	0163	0143	0123	0104	0084	[illegible]
50	0277	0258	0238	0219	0200	0180	0160	0140	0120	0101	0081	[illegible]
54.00	300274	300255	300235	300215	300196	300176	300156	300137	300117	300098	300078	[illegible]
10	0271	0252	0232	0211	0192	0172	0152	0133	0113	0094	0074	0054
20	0267	0248	0228	0208	0189	0169	0149	0130	0110	0091	0071	0051
30	0264	0245	0225	0204	0185	0165	6145	0126	0106	0087	0067	0047
40	0261	0242	0222	0201	0182	0162	0142	0122	0102	0083	0063	[illegible]
50	0257	0238	0218	0197	0178	0158	0138	0118	0108	0079	0059	[illegible]
55.00	300255	300235	300215	300195	300175	300155	300135	300115	300095	300075	300055	[illegible]
10	0252	0232	0212	0191	0171	0151	0131	0111	0091	0071	0051	[illegible]
20	0248	0228	0208	0188	0168	0148	0128	0108	0088	0068	0048	[illegible]
30	0245	0225	0205	0184	0164	0144	0124	0104	0084	0064	0044	[illegible]
40	0242	0222	0202	0181	0161	0141	0121	0101	0081	0061	0041	[illegible]
50	0238	0218	0198	0177	0157	0137	0117	0097	0077	0057	0037	[illegible]
56.00	300236	300215	300195	300175	300154	300131	300113	300093	300072	300052	300032	[illegible]
10	0233	0212	0192	0171	0150	0130	0109	0089	0068	0048	0028	[illegible]
20	0229	0208	0188	0168	0147	0127	0106	0086	0065	0045	0025	[illegible]
30	0226	0205	0185	0164	0143	0123	0102	0082	0061	0041	0021	[illegible]
40	0223	0202	0182	0161	0140	0120	0099	0079	0058	0038	0018	[illegible]
50	0219	0198	0178	0157	0136	0116	0095	0075	0054	0034	0014	[illegible]
57.00	300216	300195	300175	300154	300133	300113	300092	300071	300050	300030	300009	[illegible]
10	0213	0192	0172	0150	0129	0109	0088	0067	0046	0026	0005	[illegible]
20	0210	0189	0168	0147	0126	0106	0085	0064	0043	0023	0002	[illegible]
30	0206	0185	0165	0143	0122	0102	0081	0060	0039	0019	299998	[illegible]
40	0203	0182	0162	0140	0119	0098	0077	0056	0035	0015	9994	[illegible]
50	0200	0179	0158	0137	0115	0095	0074	0053	0032	0011	9990	[illegible]
58.00	300197	300176	300155	300134	300112	300091	300070	300049	300028	300007	299986	[illegible]
10	0194	0173	0151	0130	0108	0087	0066	0045	0024	0003	9982	9961
20	0190	0169	0148	0127	0105	0084	0063	0042	0021	0000	9979	[illegible]
30	0187	0166	0144	0123	0101	0080	0059	0038	0017	299996	9975	[illegible]
40	0184	0163	0141	0120	0098	0077	0056	0035	0014	9993	9972	9951
50	0181	0159	0137	0116	0094	0073	0052	0031	0010	9989	9968	9947
59.00	300177	300156	300134	300113	300091	300070	300048	300027	300005	299984	299963	[illegible]
10	0174	0153	0131	0110	0088	0066	0044	0023	0001	9981	9960	[illegible]
20	0170	0149	0127	0106	0084	0063	0041	0020	299998	9977	9956	[illegible]
30	0167	0146	0124	0103	0081	0059	0037	0016	9994	9973	9952	[illegible]
40	0164	0143	0121	0100	0078	0056	0034	0013	9991	9970	9949	[illegible]
50	0161	0139	0117	0096	0074	0052	0030	0009	9987	9966	9945	[illegible]
60.00	300158	300136	300114	300093	300071	300049	300027	300005	299983	299962	299940	299918
10	0155	0133	0111	0089	0067	0045	0023	0001	9979	9958	9936	9914
20	0151	0129	0107	0086	0064	0042	0020	299998	9976	9955	9933	9912
30	0148	0126	0104	0082	0060	0038	0016	9994	9972	9951	9929	9907
40	0145	0123	0101	0079	0057	0034	0012	9990	9968	9947	9925	9903
50	0142	0119	0097	0075	0053	0031	0009	9987	9965	9943	9921	9899
61.00	300138	300116	300094	300072	300050	300027	300005	299983	299961	299939	299916	299894
10	0135	0113	0091	0068	0046	0023	0001	9979	9957	9936	9913	9891
20	0131	0109	0087	0065	0643	0020	299998	9976	9954	9933	9910	9888
30	0128	0106	0084	0061	0039	0016	9994	9972	9950	9929	9906	9884
40	0125	0103	0081	0058	0036	0012	9990	9968	9946	9925	9902	9880
50	0121	0099	0077	0054	0032	0009	9987	9965	9943	9922	9899	9877

LUNI-SOLAR TABLE,

For clearing the Angular Distance between the Sun, Moon, and Stars, from the effect of Refraction and Parallax.

	Moon's Apparent Altitude.						Moon's Apparent Altitude.					
	10°						11°					
h. p.	00′	10′	20′	30′	40′	50′	00′	10′	20	30′	40′	50′
′ ″												
53.00	300063	300043	300025	300005	299981	299967	299947	299930	299910	299891	299871	29985
10	0059	0039	0021	0001	9977	9963	9943	9925	9905	9886	9866	984
20	0055	0035	0017	299997	9973	9958	9938	9920	9900	9881	9861	984
30	0051	0031	0013	9993	9968	9954	9934	9916	9896	9877	9857	983
40	0047	0027	0008	9988	9966	9950	9930	9911	9891	9872	9852	983
50	0043	0023	0004	9984	9964	9945	9925	9907	9887	9868	9848	982
54.00	300039	300019	300000	299980	299960	299911	299921	299902	299882	299863	299843	29982
10	0035	0015	299996	9976	9956	9937	9917	9897	9877	9858	9838	981
20	0031	0011	9992	9972	9952	9933	9913	9893	9873	9854	9834	981
30	0027	0007	9988	9968	9947	9928	9909	9888	9868	9849	9829	981
40	0023	0003	9984	9964	9943	9924	9905	9884	9864	9845	9825	980
50	0019	299999	9980	9960	9939	9920	9901	9879	9859	9840	9820	980
55.00	300015	299995	299975	299955	299935	299915	299895	299875	299855	299836	299816	29979
10	0011	9991	9971	9951	9931	9911	9891	9871	9851	9832	9811	979
20	0007	9987	9967	9947	9927	9906	9887	9866	9846	9827	9807	978
30	0003	9983	9962	9942	9922	9902	9883	9862	9842	9823	9802	978
40	299999	9979	9958	9938	9918	9898	9879	9858	9838	9819	9798	977
50	9995	9975	9954	9934	9914	9893	9874	9853	9833	9814	9793	977
56.00	299991	299971	299950	299930	299910	299889	299869	299849	299829	299809	299786	2997
10	9987	9967	9946	9926	9906	9885	9865	9844	9823	9804	9784	97
20	9983	9963	9942	9922	9901	9881	9861	9840	9819	9800	9780	97
30	9979	9959	9938	9918	9897	9876	9856	9835	9814	9795	9775	97
40	9975	9955	9934	9914	9893	9872	9852	9830	9810	9791	9770	97
50	9971	9951	9930	9910	9888	9868	9848	9826	9805	9786	9766	97
57.00	299967	299947	299926	299905	299884	299864	299843	299823	299802	297782	299761	2997
10	9963	9943	9922	9901	9880	9860	9839	9818	9797	0777	9756	97
20	9959	9939	9918	9897	9876	9855	9834	9814	9793	9773	9752	97
30	9955	9935	9914	9893	9871	9851	9830	9809	9788	9768	9747	97
40	9951	9931	9910	9889	9867	9847	9826	9805	9784	9764	9743	97
50	9947	9927	9906	9885	9863	9842	9821	9800	9779	9759	9738	97
58.00	299944	299923	299902	299881	299859	299838	299817	299796	299775	299755	299734	2997
10	9940	9919	9898	9877	9855	9834	9813	9792	9771	9751	9729	97
20	9936	9915	9894	9873	9851	9830	9809	9787	9766	9746	9725	97
30	9932	9911	9889	9868	9846	9825	9804	9783	9762	9742	9720	96
40	9928	9907	9885	9864	9842	9821	9800	9779	9758	9738	9715	96
50	9924	9903	9881	9860	9838	9817	9796	9774	9753	9733	9711	96
59.00	299920	299899	299877	299856	299834	299813	299791	299770	299749	299728	299705	2996
10	9916	9895	9873	9852	9830	9809	9787	9765	9744	9724	9701	96
20	9912	9891	9869	9858	9826	9804	9782	9761	9740	9720	9697	96
30	9907	9886	9864	9853	9821	9800	9778	9756	9735	9715	9692	96
40	9903	9882	9860	9849	9817	9796	9774	9752	9731	9711	9687	96
50	9899	9878	9856	9845	9813	9791	9769	9747	9726	9706	9683	96
60.00	299896	299874	299852	299831	299809	299787	299765	299743	299722	299700	299678	2996
10	9892	9870	9848	9827	9805	9783	9761	9739	9717	9697	9673	96
20	9888	9866	9844	9823	9800	9770	9756	9734	9713	9691	9669	96
30	9884	9862	9840	9819	9796	9774	9752	9730	9708	9686	9664	96
40	9880	9858	9836	9815	9792	9770	9748	9726	9704	9682	9660	86
50	9876	9854	9832	9811	9787	9765	9743	9721	9699	9677	9655	96
61.00	299872	299850	299828	299806	299783	299761	299739	299717	299695	299673	299651	2996
10	9868	9846	9824	9802	9779	9757	9735	9713	9690	9668	9646	96
20	9864	9842	9820	9798	9774	9752	9730	9708	9686	9664	9642	96
30	9860	9838	9816	9794	9770	9748	9726	9704	9681	9659	9637	96
40	9856	9834	9812	9790	9766	9744	9712	9700	9677	9655	9633	96
50	9852	9830	9808	9786	9761	9739	9707	9695	9672	9650	9628	96

TABLE XXXV.

LUNI-SOLAR TABLE,

For clearing the Angular Distance between the Sun, Moon, and Stars, from the effect of Refraction and Parallax.

	Moon's Apparent Altitude.						Moon's Apparent Altitude.				
	12°						13°				
h. p.	00′	10′	20′	30′	40′	50′	00′	10′	20′	30′	40′
′ ″											
53.00	299834	299814	299794	299774	299755	299736	299717	299700	299679	299658	299643
10	9829	9809	9789	9769	9750	9731	9712	9695	9674	9653	9638
20	9824	9804	9784	9761	9745	9726	9707	9690	9669	9648	9633
30	9820	9800	9780	9760	9741	9722	9703	9685	9664	9643	9627
40	9815	9795	9775	9755	9736	9717	9698	9679	9659	9638	9622
50	9810	9790	9770	9750	9731	9712	9693	9674	9654	9633	9616
54.00	299804	299785	299765	299746	299726	299707	299688	299669	299649	299630	299611
10	9799	9780	9760	9741	9721	9702	9683	9664	9644	9625	9606
20	9794	9775	9755	9736	9716	9697	9678	9659	9639	9620	9601
30	9789	9770	9750	9731	9711	9692	9673	9654	9634	9615	9596
40	9785	9766	9746	9727	9707	9688	9669	9649	9629	4610	9591
50	9780	9761	9741	9722	9702	9683	9664	9644	9624	9605	9586
55.00	299776	299756	299736	299717	299697	299678	299658	299638	299619	299599	299579
10	9771	9751	9731	9712	9692	9673	9653	9633	9614	9594	9574
20	9767	9747	9727	9708	9687	9668	9648	9628	9607	9587	9568
30	9762	9742	9722	9703	9682	9663	9643	9623	9603	9583	9563
40	9757	9737	9717	9698	9678	9659	9639	9618	9598	9578	9558
50	9753	9733	9713	9694	9673	9654	9634	9612	9592	9572	9552
56.00	299748	299728	299708	299688	299668	299647	299627	299607	299587	299567	299547
10	9743	9723	9703	9683	9663	9644	9624	9602	9582	9562	9542
20	9739	9719	9698	9678	9658	9639	9619	9597	9577	9557	9536
30	9734	9714	9693	9673	9553	9634	9614	9592	9571	9551	9531
40	9729	9709	9689	9669	9649	9629	9609	9587	9566	9546	9526
50	9725	9705	9684	9664	9644	9624	9604	9582	9561	9541	9520
57.00	299720	299700	299679	299659	299638	299617	299597	299577	299556	299536	299515
10	9715	9695	9674	9654	9634	9614	9594	9572	9551	9531	9510
20	9710	9690	9669	9649	9629	9608	9588	9567	9546	9526	9504
30	9705	9685	9664	9644	9623	9603	9583	9561	9540	9520	9499
40	9701	9681	9660	9640	9618	9598	9578	9556	9535	9515	9494
50	9696	9676	9655	9635	9613	9592	9572	9551	9530	9510	9488
58.00	299692	299671	299650	299629	299608	299587	299566	299546	299525	299504	299483
10	9687	9666	9645	9624	9603	9582	9561	9541	9520	9499	9478
20	9682	9661	9640	9619	9598	9577	9556	9536	9515	9494	9473
30	9677	9656	9635	9614	9593	9572	9551	9530	9509	9488	9467
40	9673	9652	9630	9609	9588	9567	9546	9525	9504	9483	9462
50	9668	9647	9625	9604	9583	9562	9541	9520	9499	9478	9457
59.00	299664	299642	299620	299599	299578	299557	299536	299515	299494	299473	299452
10	9659	9637	9615	9594	9573	9552	9531	9510	9489	9468	9447
20	9654	9632	9611	9590	9568	9547	9526	9505	9484	9463	9441
30	9649	9627	9606	9585	9563	9542	9521	9499	9478	9457	9436
40	9645	9623	9601	9580	9559	9537	9516	9494	9473	9452	9431
50	9640	9618	9597	9576	9554	9532	9511	9489	9468	9447	9425
60.00	299635	299613	299592	299570	299549	299527	299506	299484	299463	299442	299420
10	9630	9608	9587	9565	9544	9522	9501	9479	9458	9437	9415
20	9626	9604	9582	9560	9539	9517	9496	9474	9453	9432	9409
30	9621	9599	9577	9555	9534	9512	9491	9469	9447	9426	9404
40	9616	9594	9573	9551	9529	9507	9486	9464	9441	9420	9399
50	9612	9590	9568	9546	9524	9502	9481	9459	9437	9416	9393
61.00	299607	299585	299563	299541	299519	299497	299475	299454	299432	299410	299388
10	9602	9580	9558	9536	9514	9492	9470	9449	9427	9405	9383
20	9598	9576	9553	9531	9509	9487	9465	9444	9422	9400	9377
30	9593	3571	9548	9826	9504	9482	9460	9439	9416	9394	9372
40	9588	9566	9544	9522	9499	9477	9455	9434	9411	9389	9367
50	9584	9562	9539	9517	9494	9472	9450	9429	9406	9374	9361

TABLE XXXV.

LUNI-SOLAR TABLE,

For clearing the Angular Distance between the Sun, Moon, and Stars, from the effect of Refraction and Parallax.

	Moon's Apparent Altitude.						Moon's Apparent Altitude.					
	14°						15°					
h. p. ′ ″	00′	10′	20′	30′	40′	50′	00′	10′	20′	30′	40′	50′
53.00	299601	299584	299567	299549	299530	299511	299492	299472	299453	299434	299415	2993
10	9596	9579	9561	9543	9524	9505	9486	9466	9447	9428	9409	93
20	9590	9573	9555	9537	9518	9499	9480	9460	9441	9422	9403	93
30	9585	9568	9550	9532	9513	9494	9473	9455	9436	9417	9397	93
40	9580	9563	9544	9526	9507	9488	9467	9449	9430	9411	9391	93
50	9574	9557	9539	9521	9501	9482	9461	9443	9424	9405	9385	93
54.00	299572	299552	299533	299514	299495	299476	299456	299437	299418	299399	299379	2993
10	9567	9547	9527	9508	9489	9470	9450	9431	9412	9393	9373	93
20	9561	9541	9522	9503	9483	9461	9444	9425	9406	9387	9367	93
30	9556	9536	9516	9497	9477	9458	9338	9419	9400	9381	9361	93
40	9551	9531	9511	9792	9472	9453	9333	9414	9395	9376	9355	93
50	9545	9525	9505	9786	9466	9447	9327	9408	9389	9370	9349	93
55.00	299540	299520	299500	299480	299460	299441	299421	299402	299383	299363	299343	2993
10	9534	9514	9494	9474	9454	9435	9415	9396	9377	9357	9337	93
20	9529	9509	9489	9469	9449	9430	9410	9390	9371	9351	9331	93
30	9523	9503	9483	9463	9443	9424	9404	9384	9365	9345	9325	93
40	9518	9498	9478	9458	9438	9418	9398	9379	9359	9339	9319	92
50	9512	9492	9172	9452	9432	9413	9393	9373	9353	9333	9313	92
56.00	299507	299487	299467	299447	299427	299407	299387	299367	299347	299327	299307	2992
10	9501	9481	9461	9441	9421	9401	9381	9361	9341	9321	9301	92
20	9496	9476	9456	9436	9415	9395	9375	9355	9335	9315	9295	92
30	9490	9470	9450	9430	9409	9389	9369	9349	9329	9309	9289	92
40	9485	9465	9445	9425	9404	9384	9364	9344	9324	9304	9283	92
50	9479	9459	9439	9419	9398	9378	9358	9338	9318	9298	9277	92
57.00	299474	299454	299434	299413	299392	299372	299352	299332	299312	299292	299271	2992
10	9468	9448	9428	9407	9386	9366	9346	9326	9306	9286	9265	92
20	9463	9443	9423	9402	9381	9361	9341	9320	9300	9280	9259	92
30	9457	9437	9417	9396	9375	9355	9335	9314	9294	9274	9253	92
40	9452	9432	9412	9391	9370	9349	9329	9309	9288	9268	9247	92
50	9446	9426	9406	8385	9364	9314	9324	9303	9282	9262	9241	92
58.00	299442	299421	299401	299380	299359	299338	299318	299297	299276	299256	299235	2992
10	9436	9415	9395	9374	9353	9332	9312	9291	9270	9250	9229	92
20	9431	9410	9390	9369	9348	9327	9307	9285	9264	9244	9223	92
30	9425	9404	9384	9363	9342	9321	9301	9279	9258	9238	9217	91
40	9420	9399	9378	9357	9336	9315	9295	9274	9253	9233	9211	91
50	9414	9393	9373	9352	9331	9310	9290	9268	9247	9227	9205	91
59.00	299410	299388	299367	299346	299325	299304	299283	299262	299241	299220	299199	2991
10	9404	9382	9361	9340	9319	9298	9277	9256	9235	9214	9193	91
20	9399	9377	9356	9335	9314	9292	9271	9250	9229	9208	9187	91
30	9393	9371	9350	9329	9308	9286	9265	9244	9223	9202	9181	91
40	9388	9366	9345	9324	9302	9281	9260	9239	9218	9197	9175	91
50	9382	9360	9339	9318	9297	9275	9254	9233	9212	9191	9168	9
60.00	299377	299355	299334	299312	299291	299269	299248	299227	299206	299184	299163	299
10	9371	9349	9328	9306	9285	9265	9244	9221	9200	9178	9157	9
20	9366	9344	9323	9301	9280	9258	9237	9215	9194	9172	9151	9
30	9360	9338	9317	9295	9274	9252	9231	9209	9188	9166	9145	9
40	9355	9333	9311	9289	9268	9246	9225	9204	9182	9160	9139	9
50	9349	9327	9306	9284	9263	9241	9220	9198	9176	9154	9133	9
61.00	299344	299322	299300	299279	299257	299235	299213	299192	299170	299149	299127	299
10	9338	9316	9294	9273	9251	9229	9207	9186	9164	9143	9121	9
20	9333	9311	9289	9268	9246	9224	9202	9180	9158	9137	9115	9
30	9327	9305	9283	9262	9240	9218	9196	9174	9152	9131	9109	9
40	9322	9300	9277	9256	9234	9212	9190	9169	9146	9125	9103	9
50	9316	9294	9272	9251	9229	0207	9185	9163	9140	9119	9097	9

TABLE XXXV.

LUNI-SOLAR TABLE,

For clearing the Angular Distance between the Sun, Moon, and Stars, from the effect of Refraction and Parallax.

	Moon's Apparent Altitude.						Moon's Apparent Altitude.				
	16°						17°				
h· p.	00′	10′	20′	30′	40′	50′	00′	10′	20′	30′	40′
′ ″											
53.00	299377	299359	299341	299324	299305	299286	299268	299249	299230	299212	299193
10	9371	9353	9335	9318	9298	9279	9261	9242	9223	9205	9186
20	9365	9347	9328	9311	9291	9272	9254	9235	9216	9198	9179
30	9359	9341	9322	9305	9285	9266	9248	9228	9209	9191	9172
40	9352	9334	9316	9299	9278	9259	9241	9221	9202	9184	9165
50	9346	9328	9309	9292	9272	9253	9235	9214	9195	9177	9158
54.00	299341	299322	299303	299284	299265	299246	299227	299207	299188	299170	299151
10	9335	9316	9297	9278	9258	9239	9220	9200	9181	9163	9144
20	9329	9310	9290	9271	9252	9233	9214	9194	9175	9157	9138
30	9322	9303	9284	9265	9245	9226	9207	9187	9168	9150	9130
40	9316	9297	9278	9259	9239	9220	9201	9181	9162	9144	9124
50	9310	9291	9271	9252	9232	9213	9194	9174	9155	9137	9116
55.00	299305	299285	299265	299246	299226	299207	299188	299168	299149	299130	299110
10	9299	9279	9259	9240	9220	9200	9181	9161	9142	9123	9103
20	9293	9273	9253	9234	9213	9194	9175	9155	9136	9117	9096
30	9286	9266	9246	9227	9207	9187	9168	9148	9129	9110	9090
40	9280	9260	9240	9221	9201	9181	9162	9142	9122	9103	9083
50	9274	9254	9234	9215	9194	9174	9155	9135	9116	9097	9077
56.00	299268	299248	299228	299208	299188	299168	299149	299129	299109	299090	299070
10	9262	9242	9222	9202	9182	9162	9143	9122	9102	9083	9063
20	9256	9236	9215	9195	9175	9155	9136	9116	9096	9077	9057
30	9249	9229	9209	9189	9169	9149	9130	9109	9089	9070	9050
40	9243	9223	9203	9183	9163	9143	9124	9103	9083	9064	9043
50	9237	9217	9196	9176	9156	9136	9117	9096	9076	9057	9037
57.00	299231	299211	299190	299170	299150	299130	299110	299090	299070	299050	299030
10	9225	9205	9184	9164	9144	9123	9103	9083	9063	9043	9023
20	9219	9199	9178	9158	9137	9117	9097	9077	9057	9037	9017
30	9212	9192	9171	9151	9131	9110	9090	9070	9050	9030	9009
40	9206	9186	9165	9145	9125	9104	9084	9063	9043	9023	9003
50	9200	9180	9159	9139	9118	9097	9077	9057	9037	9017	8997
58.00	299194	299174	299153	299132	299112	299091	299071	299050	299030	299010	298989
10	9188	9168	9147	9126	9105	9085	9065	9043	9023	9003	8982
20	9181	9161	9140	9119	9099	9078	9058	9037	9017	298997	8975
30	9175	9155	9134	9113	9092	9072	9052	9030	9010	8990	8969
40	9169	9149	9128	9107	9086	9066	9046	9024	9003	8933	8962
50	9162	9142	9121	9100	9079	9059	9039	9017	8997	8977	8956
59.00	299157	299136	299115	299094	299073	299053	299032	299011	298990	298970	298949
10	9151	9130	9109	9088	9067	9046	9025	9004	8983	8963	8942
20	9145	9124	9103	9082	9060	9040	9019	8998	8976	8956	8936
30	9138	9117	9096	9075	9054	9033	9012	8991	8969	8949	8928
40	9132	9111	9090	9069	9048	9027	9006	8985	8964	8944	8922
50	9126	9105	9084	9063	9041	9020	8999	8978	8957	8937	8915
60.00	299121	299099	299078	299056	299035	299014	298993	298972	298951	298930	298908
10	9115	9093	9072	9050	9029	9008	8987	8965	8944	8923	8901
20	9109	9087	9065	9043	9022	9001	8980	8959	8938	8917	8894
30	9102	9080	9059	9037	9016	8995	8974	8952	8931	8910	8888
40	9096	9074	9053	9031	9010	8989	8968	8946	8924	8903	8881
50	9090	9068	9046	9024	9003	8982	8961	8939	8918	8897	8875
61.00	299084	299062	299040	299019	298997	298976	298954	298932	298911	298890	298868
10	9078	9056	9034	9013	8991	8970	8948	8925	8904	8883	8861
20	9072	9050	9027	9006	8984	8963	8941	8919	8898	8876	8855
30	9065	9043	9021	9000	8978	8957	8935	8912	8891	8870	8848
40	9059	9037	9015	8994	8972	8951	8929	8906	8884	8863	8841
50	9053	9031	9008	8987	8965	8944	8922	8899	8878	8856	8835

TABLE XXXV.

LUNI-SOLAR TABLE,

For clearing the Angular Distance between the Sun, Moon, and Stars, from the effect of Refraction and Parallax.

	Moon's Apparent Altitude.						Moon's Apparent Altitude.					
	18°						19°					
h. p.	00′	10′	20′	30′	40′	50′	00′	10′	20′	30′	40′	50′
′ ″												
53.00	299155	299136	299117	299098	297709	299060	299042	299023	299004	298985	298966	298954
10	9148	9129	9110	9091	9072	9053	9035	9016	8997	8978	8959	8946
20	9141	9122	9103	9084	9065	9046	9928	9009	8990	8971	8952	8938
30	9134	9115	9096	9077	9058	9039	9021	9002	8983	8964	8945	8930
40	9127	9108	9089	9079	9051	9032	9014	8995	8976	8957	8938	8922
50	9120	9101	9082	9063	9044	9025	9007	8988	8969	8950	8931	8914
54.00	299114	399097	299075	299056	299037	299018	299000	298981	298962	298943	298924	298906
10	9107	9084	9068	9049	9030	9011	8993	8974	8955	8936	8917	8898
20	9099	9080	9061	9042	9023	9004	8986	8966	8947	8928	8909	8891
30	9092	9073	9054	9035	9016	8997	8979	8959	8940	8921	8902	8883
40	9085	9066	9047	9028	9009	8990	8972	8952	8934	8914	8895	8876
50	9078	9059	9040	9021	9002	8983	8965	8944	8925	8906	8887	8868
55.00	299072	299052	299033	299014	298995	298976	298957	298937	298918	298899	298880	298861
10	9065	9045	9026	9008	8988	8969	8950	8930	8911	8892	8872	8853
20	9058	9038	9019	9001	8981	8962	8943	8923	8903	8884	8865	8846
30	9051	9031	9012	8994	8973	8954	8935	8915	8896	8878	8857	8638
40	9045	9025	9006	8988	8966	8947	8928	8908	8889	8871	3850	8831
50	9038	9018	8999	8981	8959	8940	8921	8901	8881	8863	8842	8823
56.00	299031	299011	298992	298972	298952	298933	298914	208894	298874	298855	298835	298816
10	9024	9004	8985	8965	8945	8926	8907	8887	8867	8848	8828	8808
20	9017	8997	8978	8958	8938	8919	8900	8880	8860	8842	8820	8801
30	9010	8990	8971	8951	8931	8911	8892	8872	8852	8834	8813	8793
40	9004	8984	8964	8944	8924	8904	8885	8865	8845	8827	8806	8786
50	8997	8977	8957	8937	8917	298897	8878	8858	8838	8820	8798	3778
57.00	298990	298970	298950	298930	298910	298890	298871	298851	298831	298811	298791	298771
10	8984	8964	8944	8924	8904	8884	8865	8845	8825	8805	8785	8765
20	8977	8957	8937	8917	8898	8878	8857	8839	8819	8799	8779	8759
30	8971	8951	8931	8911	8891	8871	8850	8832	8812	8782	8773	8753
40	8965	8945	8925	8905	8885	8865	8844	8826	8806	8776	8767	8747
50	8958	8938	8918	8898	8879	8859	8838	8820	8800	8770	8761	8741
58.00	298952	298932	298912	298892	298873	298853	298834	298814	298791	298775	298755	298736
10	8944	8924	8904	8884	8865	8845	8826	8806	8785	8766	8746	8727
20	8937	8917	8897	8577	8857	8837	8818	8797	8777	8758	8737	8718
30	8931	8909	8889	8869	8849	8828	8809	8789	8768	8749	8728	8709
40	8924	8902	8881	8861	8841	8820	8801	8781	8760	8741	8720	8700
50	8916	8894	8874	8854	8833	8812	8793	8773	8751	8732	8711	8691
9 . 00	298908	298887	298866	298845	298825	298804	298784	298764	298743	298723	298703	298682
10	8901	8880	8859	8838	8818	8797	8777	8757	8736	8716	8694	8674
20	8894	8873	8852	8831	8811	8790	8770	8749	8728	8708	8687	8667
30	8887	8866	8845	8824	8803	8783	8763	8742	8721	8701	8679	8659
40	8880	8859	8838	8817	8796	8776	8756	8735	8714	8694	8672	8651
50	8873	8852	8831	8810	8789	8769	8749	8727	8706	8686	8664	8644
— 00	298866	298845	298824	298803	298782	298762	298741	298720	298699	298678	298657	298636
10	8859	8838	8817	8796	8775	8755	8734	8713	8692	8671	8650	8629
20	8852	8831	8810	8789	8768	8748	8727	8705	8684	8663	8642	8621
30	8845	8824	8803	8782	8761	8740	8719	8698	8677	8656	8635	8614
40	8839	8818	8797	8776	8754	8733	8712	8691	8670	8649	8628	8607
50	8832	8811	8790	8769	8747	8726	8705	8683	8662	8641	8620	8599
— 00	298826	298804	298783	298761	298740	298719	298697	298676	298655	298634	298613	298592
10	8819	8797	8776	8754	8733	8712	8690	8669	8648	8627	8606	8585
20	8812	8790	8769	8747	8726	8705	8683	8661	8640	8619	8598	8572
30	8805	8783	8761	8739	8719	8697	8677	8654	8633	8612	8591	8570
40	8799	8777	8756	8724	8712	8690	8668	8647	8626	8605	8584	8563
50	8792	8770	8749	8717	8705	8683	8661	8639	8618	8599	8576	8555

TABLE XXXV.

LUNI-SOLAR TABLE,

For clearing the Angular Distance between the Sun, Moon, and Star
the effect of Refraction and Parallax.

	Moon's Apparent Altitude.						Moon's Apparent Altitud				
	20°						21°				
h. p.	00′	10′	20′	30′	40′	50′	00′	10′	20′	30′	40
′ ″											
53.00	298934	298916	298897	298879	298861	298842	298823	298805	298786	298767	2987
10	8926	8908	8889	8871	8853	8834	8815	8797	8778	8759	87
20	8918	8900	8881	8863	8845	8826	8807	8789	8770	8751	87
30	8910	8892	8873	8855	8837	8818	8799	8781	8762	8743	87
40	8902	8884	8865	8847	8829	8810	8791	8773	8754	8735	87
50	8894	8876	8858	8840	8821	8802	8783	8765	8746	8727	87
54.00	298887	298868	298850	298831	298813	298794	298775	298757	298738	298720	2987
10	8878	8860	8842	8824	8805	8786	8767	8749	8730	8711	86
20	8871	8853	8835	8817	8797	8778	8759	8741	8722	8703	86
30	8863	8846	8827	8809	8789	8770	8751	8732	8714	8695	86
40	8856	8839	8819	8801	8782	8763	8744	8724	8706	8687	86
50	8848	8832	8812	8794	8774	8755	8736	8717	8698	8679	86
55.00	298842	298824	298804	298785	298766	298747	298728	298708	298690	298671	2986
10	8834	8816	8796	8777	8758	8739	8720	8700	8682	8664	86
20	8827	8808	8789	8770	8750	8731	8712	8693	8674	8656	86
30	8819	8800	8781	8762	8742	8723	8704	8685	8666	8648	86
40	8812	8793	8773	8754	8735	8716	8697	8677	8658	8640	86
50	8804	8785	8766	8747	8727	8708	8689	8670	8650	8632	861
56.00	298797	298777	298758	298739	298719	298700	298681	298662	298642	298623	29860
10	8789	8769	8750	8731	8711	8692	8673	8654	8634	8614	85
20	8782	8762	8743	8724	8704	8684	8665	8646	8626	8606	85
30	8775	8755	8735	8716	8696	8676	8657	8638	8618	8598	857
40	8767	8747	8727	8708	8688	8669	8650	8630	8610	8590	857
50	8759	8739	8720	8701	8681	8661	8642	8622	8602	8582	856
57.00	298752	298732	298712	298692	298673	298653	298634	298614	298594	298575	29855
10	8745	8725	8704	8684	8665	8645	8625	8606	8586	8566	854
20	8737	8717	8697	8677	8657	8637	8617	8598	8578	8558	853
30	8729	8709	8689	8669	8649	8629	8609	8590	8570	8550	853
40	8722	8702	8681	8661	8642	8622	8602	8582	8562	8542	852
50	8714	8694	8674	8654	8634	8614	8594	8574	8554	8534	851
58.00	298706	298686	298666	298646	298626	298606	298586	298566	298546	298526	29850
10	8698	8678	8658	8638	8618	8598	8578	8558	8538	8518	849
20	8691	8671	8651	8631	8610	8590	8570	8550	8530	8510	849
30	8683	8663	8643	8623	8602	8582	8562	8542	8522	8502	848
40	8676	8656	8635	8615	8595	8575	8555	8535	8514	8494	847
50	8668	8648	8628	8608	8587	8567	8547	8527	8506	8486	846
59.00	298661	298641	298620	298600	298579	298559	298539	298519	298498	295478	29845
10	8653	8633	8612	8591	8571	8551	8531	8511	8490	8469	845
20	8646	8626	8605	8584	8564	8543	8523	8503	8482	8461	844
30	8638	8618	8599	8578	8556	8535	8515	8495	8474	8453	843
40	8631	8611	8590	8569	8548	8528	8508	8487	8466	8445	842
50	8623	8603	8582	8561	8541	8520	8500	8479	8458	8439	841
60.00	298616	298595	298575	298554	298533	298512	298492	298471	298450	298430	29840
10	8608	8587	8567	8547	8525	8504	8483	8463	8443	8421	8401
20	8601	8580	8559	8539	8517	8497	8476	8455	8434	8413	839
30	8593	8572	8551	8531	8509	8489	8468	8447	8426	8405	838
40	8586	8565	8544	8524	8502	8482	8461	8439	8418	8397	837
50	8578	8557	8536	8516	8494	8474	8453	8431	8410	8389	836
61.00	298571	298549	298528	298507	298486	298467	298444	298423	298402	208382	298361
10	8563	8541	8520	8499	8478	8459	8440	8415	8394	8373	835
20	8556	8534	8512	8491	8470	8452	8433	8407	8386	8365	834
30	8548	8526	8504	8483	8462	8444	8425	8399	8378	8357	8337
40	8541	8519	8497	8476	8455	8437	8418	8391	8370	8349	832
50	8533	8511	8489	8468	8447	8429	8410	8383	8362	8341	8321

TABLE XXXV.

LUNI-SOLAR TABLE,

For clearing the Angular Distance between the Sun, Moon, and Stars, from the effect of Refraction and Parallax.

	Moon's Apparent Altitude.						Moon's Apparent Altitude.					
	22°						23°					
h. p. ′ ″	00	10′	20′	30′	40′	50′	00′	10′	20′	30′	40′	50′
53.00	298712	298694	298676	298658	298645	298627	298609	298590	298572	298553	298535	298517
10	8704	8686	8668	8650	8636	8618	8600	8581	8563	8544	8526	8508
20	8696	8678	8660	8642	8627	8609	8591	8572	8554	8535	8517	8499
30	8688	8670	8652	8634	8618	8600	8582	8563	8545	8526	8508	8490
40	8680	8662	8644	8626	8609	8591	8573	8554	8536	8517	8499	8481
50	8672	8654	8636	8618	8600	8582	8564	8545	8527	8508	8490	8472
54.00	298665	298646	298628	298609	298591	298573	298554	298536	298518	298499	298481	298463
10	8656	8638	8620	8602	8582	8564	8546	8527	8509	8490	8472	8454
20	8648	8630	8611	8593	8574	8556	8538	8519	8501	8482	8464	8445
30	8639	8621	8603	8585	8565	8547	8529	8510	8492	8473	8455	8436
40	8631	8613	8595	8577	8557	8539	8521	8501	8483	8464	8446	8428
50	8623	8605	8587	8569	8548	8530	8512	8493	8475	8456	8438	8419
55.00	298616	298597	298578	298559	298540	298522	298503	298484	298466	298447	298429	298410
10	8608	8589	8570	8551	8532	8513	8495	8475	8457	8438	8420	8401
20	8599	8580	8561	8542	8523	8505	8487	8467	8449	8430	8411	8392
30	8591	8572	8553	8534	8514	8496	8478	8458	8440	8421	8402	8383
40	8582	8564	8545	8526	8506	8487	8469	8449	8431	8412	8394	8375
50	8574	8556	8537	8518	8497	8479	8461	8441	8423	8404	8385	8366
56.00	298566	298547	298528	298509	298489	298470	298451	298432	298414	298395	298376	298357
10	8588	8539	8520	8501	8481	8461	8442	8423	8405	8386	8367	8348
20	8549	9530	8511	8492	8472	8453	8434	8415	8396	8377	8358	8339
30	8541	8522	8503	3484	8464	8444	8425	8406	8387	8368	8349	8330
40	8532	8513	8495	8476	8456	8436	8417	8398	8379	8360	8341	8322
50	8525	8506	8487	8468	8448	8427	8408	8389	8370	8351	8332	8313
57.00	298517	298497	298478	298458	298439	298419	298400	298381	298361	298342	298323	298304
10	8508	8489	8470	8451	8430	8410	8390	8372	8352	8333	8314	8295
20	8500	8481	8461	8442	8422	8402	8382	8364	8344	8325	8305	8286
30	8491	8472	8453	8434	8413	8393	8373	8355	8335	8316	8296	8277
40	8483	8464	8445	8426	8405	8385	8365	8346	8326	8307	8288	8269
50	8475	8156	8437	8418	8396	8376	8356	8338	8318	8299	8279	8260
58.00	298467	298448	298428	298408	298388	298368	298349	298329	298309	298290	298270	298251
10	8460	8440	8420	8400	8379	8359	8339	8320	8300	8281	8261	8242
20	8451	8431	8411	8391	8371	8391	8331	8312	8292	8272	8253	8233
30	8443	8423	8403	8383	8362	8312	8322	8303	8283	8263	8244	8224
40	8435	8415	8395	8375	8354	8334	8314	8294	8274	8255	8235	8216
50	8427	8407	8387	8367	8345	8325	8305	8286	8266	8246	8227	8207
59.00	298418	298398	298378	298358	298337	298317	298297	298277	298257	298237	298218	298198
10	8410	8390	8369	8349	8329	8308	8288	8268	8248	8228	8209	8189
20	8401	8381	8361	8341	8320	8300	8280	8261	8240	8220	8200	8180
30	8393	8373	8352	8332	8312	8291	8271	8251	8231	8211	8291	8171
40	8385	8365	8344	8324	8304	8283	8263	8243	8222	8202	8183	8163
50	8377	8357	8335	8315	8296	8274	8254	8234	8214	8194	8174	8154
60 00	298369	298348	298328	298307	298287	298266	298246	298226	298205	298185	298165	298145
10	8361	8340	8319	8298	8278	8257	8236	8217	8196	8176	8156	8136
20	8353	8332	8311	8290	8270	8249	8228	8209	8188	8168	8147	8127
30	8344	8323	8302	8281	8261	8240	8219	8200	8179	8159	8138	8118
40	8336	8315	8294	8274	8253	8232	8211	8191	8170	8150	8130	8110
50	8328	8307	8286	8266	8244	8223	8202	8183	8162	8142	8121	8101
61.00	298320	298299	298278	298257	298236	298215	298194	298174	298153	298133	298112	298092
10	8312	8291	8270	8249	8227	8206	8185	8165	8144	8125	8103	8083
20	8304	8283	8262	8241	8219	8198	8177	8157	8136	8116	8094	8074
30	8295	8274	8253	8232	8210	8189	8168	8148	8127	8107	8085	8065
40	8287	8266	8245	8224	8202	8181	8160	8139	8118	8098	8077	805
50	8279	8258	8237	8216	8193	8172	8151	8131	8110	8090	8068	804

TABLE XXXV.

LUNI-SOLAR TABLE,

For clearing the Angular Distance between the Sun, Moon, and Stars,
the effect of Refraction and Parallax.

	Moon's Apparent Altitude.						Moon's Apparent Altitude.				
	24°						25°				
h. p. ′ ″	00′	10′	20′	30′	40′	50′	00′	10′	20′	30′	40′
53.00	298499	298481	298463	298445	298429	298411	298393	298375	298357	298339	298323
10	8490	8472	8454	8436	8420	8402	8384	8366	8348	8330	8313
20	8481	8463	8445	8427	8410	8392	8374	8356	8338	8320	8303
30	8472	8454	8436	8418	8401	8383	8365	8347	8329	8310	8294
40	8463	8445	8427	8409	8392	8374	8356	8338	8320	8302	8284
50	8454	8436	8418	8400	8382	8364	8346	8328	8310	8292	8275
54.00	298445	298427	298409	298391	298374	298355	298337	298319	298301	298283	298265
10	8436	8418	8400	8382	8364	8346	8328	8310	8292	8274	8255
20	8427	8409	8391	8373	8355	8336	8318	8300	8282	8264	8246
30	8418	8400	7382	8364	8345	8327	8309	8291	8273	8255	8236
40	8409	8391	8374	8356	8336	8318	8300	8282	8264	8246	8227
50	8400	8382	8365	8347	8327	8308	8290	8272	8254	8236	8217
55.00	298392	298323	298355	298336	298318	298299	298281	298263	298245	298226	298208
10	8383	8364	8346	8327	8309	8290	8272	8254	8235	8217	8198
20	8373	8355	8337	8318	8300	8281	8263	8244	8226	8208	8189
30	8364	8346	8328	8309	8290	8271	8253	8235	8216	8198	8180
40	8356	8338	8320	8301	8281	8262	8244	8226	8207	8189	8170
50	8347	8329	8311	8292	8272	8253	8235	8216	8197	8179	8160
56.00	298339	298320	298301	298282	298263	298244	298226	298207	298188	298170	298151
10	8330	8311	8292	8273	8254	8235	8217	8198	8179	8161	8141
20	8320	8302	8282	8263	8245	8226	8208	8188	8169	8151	8132
30	8311	8293	8273	8254	8235	8216	8198	8179	8160	8142	8122
40	8302	8284	8264	8245	8226	8207	8189	8170	8151	8133	8113
50	8293	8275	8255	8230	8217	8198	8180	8160	8141	8123	8103
57.00	298285	298266	298246	298227	298208	298189	298170	298151	298132	298113	298094
10	8276	8257	8237	8218	8199	8180	8161	8142	8123	8104	8085
20	8267	8248	8228	8209	8190	8171	8152	8132	8113	8094	8075
30	8258	8239	8218	8199	8180	8161	8142	8123	8104	8085	8066
40	8249	8230	8209	8190	8171	8152	8133	8114	8095	8076	8057
50	8240	8221	8200	8181	8162	8143	8124	8104	8085	8066	8047
58.00	298232	298212	298191	298172	298153	298134	298115	298096	298076	298057	298038
10	8223	8203	8182	8163	8144	8125	8106	8087	8067	8048	8028
20	8214	8194	8173	8154	8135	8116	8097	8077	8058	8039	8019
30	8205	8185	8164	8145	8126	8106	8087	8068	8048	8029	8009
40	8196	8176	8156	8137	8117	8097	8078	8059	8039	8020	8000
50	8187	4167	8147	8128	8108	8088	8069	8049	8029	8010	7990
59.00	298178	298158	298138	298118	298099	298079	298059	298040	298020	298001	297981
10	8169	8149	8129	8109	8090	8070	8050	8031	8011	8992	7971
20	8160	8140	8120	8100	8081	8061	8041	8021	8002	8983	7962
30	8151	8131	8111	8091	8071	8051	8032	8012	7992	8973	7952
40	8142	8122	8102	8082	8062	8042	8023	8003	7983	8964	7943
50	8133	8113	8093	8073	8053	8033	8014	7993	7973	8954	7933
60.00	298125	298104	298084	298064	298044	298024	298004	297984	297964	297944	297924
10	8115	8095	8075	8055	8035	8015	7995	7975	7955	7939	7914
20	8106	8086	8066	8046	8026	8006	7986	7966	7946	7926	7905
30	8097	8077	8057	8037	8016	7996	7976	7956	7936	7916	7895
40	8089	8069	8048	8028	8006	7987	7965	7947	7927	7907	7886
50	8080	8060	8039	8018	7998	7978	7956	7937	7917	7897	7876
61.00	298072	298051	298030	298010	297989	297969	297948	297928	297908	297888	297867
10	8063	8042	8021	8000	7980	7960	7940	7919	7899	7879	7857
20	8054	8033	8012	7991	7971	7951	7931	7910	7890	7870	7848
30	8045	8024	8012	7982	7961	7941	7931	7900	7880	7860	7838
40	8036	8016	7994	7972	7952	7932	7922	7891	7871	7951	7829
50	8027	8007	7985	7963	7943	7903	7913	7881	7861	7841	7819

TABLE XXXV.

LUNI-SOLAR TABLE,

For clearing the Angular Distance between the Sun, Moon, and Stars, from the effect of Refraction and Parallax.

	Moon's Apparent Altitude.						Moon's Apparent Altitude.					
	26°						27°					
h. p.	00′	10′	20′	30′	40′	50′	00′	10′	20′	30	40′	50
′ ″												
53.00	298287	298269	298251	298233	298217	298199	298181	298163	298147	298130	298113	298
10	8277	8259	8241	8223	8207	8189	8171	8153	8137	8120	8103	8
20	8268	8250	8232	8214	8197	8179	8161	8143	8127	8110	8093	8
30	8258	8240	8222	8204	8188	8170	8152	8134	8117	8100	8083	8
40	8248	8230	8212	8194	8178	8160	8142	8124	8107	8090	8072	8
50	8239	8221	8203	8185	8168	8150	8132	8114	8097	8080	8062	8
54.00	298229	298211	298193	298175	298158	298140	298122	298104	298087	298069	298052	298
10	8219	8201	8183	8165	8148	8130	8112	8094	8077	8060	8042	8
20	8210	8192	8174	8155	8138	8120	8102	8084	8067	8050	8032	8
30	8200	8182	8164	8146	8128	8110	8092	8074	8057	8040	8021	8
40	8190	8172	8154	8136	8119	8101	8083	8065	8047	8030	8011	7
50	8181	8163	8145	8127	8109	8091	8073	8055	8037	8020	8001	7
55.00	298172	298153	298135	298117	398099	298081	298063	298045	298027	298009	297991	297
10	8162	8143	8125	8107	8089	8071	8053	8035	8017	7999	7981	7
20	8152	8134	8116	8098	8079	8061	8043	8025	8007	7989	7971	7
30	8142	8124	8106	8088	8069	8051	8033	8015	7997	7978	7960	7
40	8132	8114	8096	8078	8060	8042	8024	8005	7987	7968	7950	7
50	8123	8105	8087	8069	8050	8032	8014	7995	7977	7958	7940	7
56.00	298114	208095	298077	298059	298040	298022	298003	297985	297967	297948	297930	297
10	8103	8085	8067	8049	8030	8012	7994	7975	7957	7938	7920	7
20	8094	8076	8058	8040	8020	8002	7984	7965	7947	7928	7910	7
30	8084	8066	8048	8030	8010	7992	7974	7955	7937	7918	7899	7
40	8075	8057	8038	8020	8001	7983	7964	7945	7927	7908	7889	7
50	8065	8047	8029	8011	7991	7973	7955	7935	7917	7898	7879	7
57.00	298057	298038	298019	298000	297981	297963	298944	297925	297907	297888	297869	297
10	8047	8028	8009	7990	7971	7953	7935	7915	7897	7878	7859	7
20	8038	8019	8000	7981	7962	7943	7925	7905	7887	7868	7849	7
30	8028	8009	7990	7971	7952	7933	7915	7895	7877	7858	7839	7
40	8018	7999	7980	7961	7942	7924	7906	7886	7867	7848	7829	7
50	8009	7990	7971	7952	7933	7914	7896	7876	7857	7838	7819	7
58.00	298000	297980	297961	297942	297923	297904	297885	297866	297847	297828	297809	297
10	7990	7970	7951	7932	7913	7894	7875	7856	7837	7818	7799	7
20	7980	7961	7942	7923	7903	7884	7865	7846	7827	7808	7789	7
30	7970	7951	7932	7913	7893	7874	7855	7836	7817	7797	7778	7
40	7960	7941	7922	7903	7884	7865	7846	7826	7807	7787	7768	7
50	7951	7932	7913	7894	7874	7855	7836	7816	7797	7777	7758	7
59.00	297942	297922	297903	297883	297864	297845	297825	297806	297787	297767	297748	297
10	7931	7912	7893	7874	7854	7835	7816	7796	7777	7757	7738	7
20	7922	7903	7884	7865	7844	7825	7806	7786	7767	7747	7728	7
30	7912	7893	7874	7855	7834	7815	7796	7776	7757	7737	7717	7
40	7903	7884	7864	7845	7825	7805	7787	7766	7747	7727	7707	7
50	7893	7874	7855	7836	7815	7795	7777	7756	7737	7717	7697	7
60.00	297885	297865	297845	297825	297805	297785	297766	297746	297727	297707	297687	297
10	7875	7855	7835	7815	7795	7775	7755	7736	7717	7697	7677	7
20	7866	7840	7826	7806	7785	7765	7745	7726	7707	7687	7667	7
30	7856	7836	7816	7796	7775	7755	7735	7716	7697	7677	7657	7
40	7846	7826	7806	7786	7766	7746	7726	7706	7687	7667	7647	7
50	7837	7817	7797	7777	7756	7736	7716	7696	7677	7657	7637	7
61.00	297827	297807	297787	297767	297746	297726	297706	207686	297667	297647	297627	297
10	7817	7797	7777	7757	7736	7716	7696	7676	7657	7638	7617	7
20	8808	7788	7768	7748	7726	7706	7686	7666	7647	7628	7607	7
30	7798	7778	7758	7738	7716	7796	7676	7656	7637	7618	7597	7
40	7788	7768	7748	7728	7707	7787	7667	7646	7627	7608	7587	7
50	7779	7759	7739	7719	7697	7777	7657	7636	7617	7598	7577	7

TABLE XXXV.

LUNI-SOLAR TABLE,

For clearing the Angular Distance between the Sun, Moon, and Stars, fro
the effect of Refraction and Parallax.

h. p.	Moon's Apparent Altitude. 28°						Moon's Apparent Altitude. 29°				
′ ″	00′	10′	20′	30′	40′	50′	00′	10′	20′	30′	40′
53.00	298077	298060	298044	298027	298011	297993	297975	297959	297941	297923	297908
10	8067	8050	8034	8017	8000	7982	7964	7948	7930	7912	7897
20	8057	8040	8023	8006	7989	7971	7953	7938	7920	7902	7886
30	8047	8030	8013	7996	7979	7961	7943	7927	7909	7891	7876
40	8037	8019	8003	7986	7968	7950	7932	7916	7898	7880	7866
50	8026	8009	7292	7975	7958	7940	7922	7906	7888	7870	7854
54.00	298017	297999	297982	297964	297947	297929	297912	297895	297877	297860	297843
10	8006	7988	7972	7955	7936	7918	7900	7884	7866	7848	7832
20	7996	7979	7961	7944	7926	7908	7890	7874	7856	7838	7821
30	7985	7968	7951	7934	7915	7897	7879	7863	7845	7827	7810
40	7975	7958	7941	7924	7905	7887	7869	7852	7834	7816	7800
50	7965	7948	7930	7913	7894	7876	7858	7842	7824	7806	7789
55.00	297956	297938	297920	297902	297884	297866	297849	297831	297813	297796	297778
10	7945	7927	7910	7892	7873	7855	7837	7820	7802	7784	7767
20	7935	7917	7899	7881	7863	7845	7827	7810	7792	7774	7757
30	7925	7907	7889	7871	7852	7834	7816	7799	7781	7763	7746
40	7915	7897	7879	7861	7841	7824	7806	7788	7770	7752	7735
50	7904	7886	7868	7850	7831	7813	7795	7778	7760	7742	7723
56.00	297894	297876	297858	297840	297820	297803	297785	297767	297749	297731	297714
10	7884	7866	7848	7830	7810	7792	7775	7756	7738	7720	7703
20	7873	7855	7837	7819	7800	7781	7764	3746	7728	7710	7692
30	7863	7845	7827	7809	7789	7771	7754	7735	7717	7699	7681
40	7853	7835	7817	7799	7779	7761	7744	7725	7707	7689	7671
50	7842	7824	7806	7788	7769	7750	7733	7714	7696	7678	7660
57.00	297833	297814	297796	297777	297759	297740	297722	297704	297686	297667	297649
10	7822	7804	7786	7768	7748	7730	7711	7693	7675	7657	7638
20	7812	7794	7775	7757	7738	7719	7700	7683	7665	7647	7627
30	7801	7783	7765	7747	7727	7709	7690	7672	7654	7636	7616
40	7791	7773	7755	7737	7717	7699	7680	7661	7643	7625	7606
50	7781	7763	7744	7726	7706	7688	7669	7651	7632	7614	7595
58.00	297772	297753	297734	297715	297696	297678	297659	297640	297622	297603	297584
10	7762	7743	7724	7705	7686	7667	7649	7629	7611	7593	7573
20	7751	7732	7713	7694	7675	7657	7639	7619	7601	7583	7563
30	7741	7722	7703	7684	7665	7646	7628	7608	7580	7572	7552
40	7731	7712	7693	7674	7655	7636	7618	7598	7577	7559	7541
50	7720	7701	7682	7663	7644	7625	7607	7587	7569	7550	7531
59.00	297710	297691	297672	297653	297634	297615	297596	297577	297558	297539	297520
10	7700	7681	7662	7643	7624	7604	7584	7566	7547	7528	7509
20	7689	7670	7651	7632	7613	7594	7575	7551	7537	7518	7498
30	7679	7660	7641	7622	7602	7583	7564	7545	7526	7507	7487
40	7669	7650	7631	7612	7592	7573	7554	7534	7515	7496	7477
50	7658	7639	7620	7601	7581	7562	7543	7523	7505	7486	7466
60.00	297649	297629	297610	297590	297571	297552	297532	297513	297494	297474	297455
10	7638	7619	7600	7581	7560	7541	7522	7502	7483	7464	7444
20	7627	7608	7689	7570	7550	7531	7512	7492	7473	7454	7434
30	7617	7598	7679	7560	7539	7520	7501	7481	7462	7443	7424
40	7607	7588	7669	7550	7529	7510	7491	7470	7451	7432	7412
50	7596	7577	7658	7539	7518	7499	7480	7460	7441	7422	7402
61.00	297587	297567	297548	297528	297508	297489	297469	297449	297430	297410	297391
10	7576	7557	7538	7519	7497	7478	7459	7438	7419	7400	7380
20	7565	7546	7527	7508	7487	7468	7449	7428	7409	7390	7370
30	7555	7536	7518	7499	7477	7457	7438	7417	7398	7379	7359
40	7545	7526	7507	7488	7466	7447	7428	7406	7387	7368	7348
50	7534	7516	7496	7477	7455	7436	7417	7396	7377	7358	7338

TABLE XXXV.

LUNI-SOLAR TABLE,

For clearing the Angular Distance between the Sun, Moon, and Stars, from the effect of Refraction and Parallax.

	Moon's Apparent Altitude.						Moon's Apparent Altitude.					
	30°						31°					
h. p.	00′	10′	20′	30′	40′	50′	00′	10′	20′	30′	40′	50′
′ ″												
53.00	297876	297858	297840	297823	297807	297796	297779	297757	297740	297723	297708	297691
10	7865	7847	7829	7812	7796	7784	7767	7746	7729	7712	7696	7679
20	7854	7836	7818	7801	7785	7772	7755	7734	7717	7700	7684	7667
30	7843	7825	7807	7790	7773	7760	7743	7723	7706	7689	7673	7656
40	7832	7814	7796	7779	7762	7747	7730	7712	7695	7678	7661	7644
50	7821	7803	7785	7768	7751	7635	7718	7700	7683	7666	7650	7633
54.00	297809	297792	297774	297757	297740	297723	297706	297689	297672	297655	297638	297621
10	7798	7781	7763	7746	7729	7711	7694	7678	7661	7644	7626	7609
20	7787	7770	7752	7735	7718	7699	7682	7666	7649	7632	7615	7598
30	7776	7759	7741	7724	7706	7686	7669	7655	7638	7621	7603	7586
40	7785	7740	7730	7713	7695	7674	7657	7644	7627	7610	7592	7575
50	7754	7737	7719	7702	7684	7662	7645	7632	7615	7598	7580	7563
55.00	297743	297726	297708	297691	297673	297650	297639	297621	297604	297587	297569	297552
10	7732	7715	7697	7680	7662	7640	7627	7610	7593	7576	7558	7541
20	7721	7704	7686	7669	7651	7630	7616	7599	7581	7564	7546	7529
30	7710	7693	7675	7658	7640	7619	7605	7587	7570	7553	7535	7518
40	7699	7682	7665	7647	7629	7609	7594	7576	7559	7542	7524	7507
50	7688	7671	7654	7636	7618	7599	7583	7565	7547	7530	7512	7495
56.00	297678	297660	297643	297625	297607	297589	297571	297554	297536	297519	297501	297484
10	7667	7649	7632	7614	7596	7578	7560	7543	7525	7508	7490	7472
20	7656	7638	7621	7603	7585	7567	7549	7531	7514	7497	7478	7461
30	7645	7627	7609	7591	7573	7555	7537	7520	7502	7485	7467	7449
40	7634	7616	7598	7580	7562	7544	7526	7509	7491	7474	7456	7438
50	7623	7605	7587	7569	7551	7533	7515	7497	7480	7463	7444	7426
57.00	297613	297594	297576	297558	297540	297522	297504	297486	297469	297451	297433	297415
10	7602	7583	7565	7547	7529	7511	7493	7475	7458	7430	7421	7403
20	7591	7572	7554	7536	7518	7500	7482	7464	7446	7428	7410	7392
30	7580	7561	7543	7525	7507	7489	7471	7452	7435	7417	7398	7380
40	7570	7551	7532	7514	7496	7478	7460	7441	7424	7406	7387	7369
50	7559	7540	7521	7503	7485	7467	7449	7430	7412	7394	7375	7357
58.00	297548	297529	297510	297492	297474	297456	297437	297419	297401	297382	297364	297346
10	7537	7518	7499	7481	7463	7445	7426	7408	7390	7371	7353	7335
20	7526	7507	7488	7470	7452	7431	7415	7397	7378	7359	7341	7323
30	7515	7496	7477	7459	7440	7422	7404	7385	7367	7348	7330	7312
40	7505	7486	7467	7449	7429	7411	7392	7374	7356	7337	7319	7301
50	7494	7475	7456	7438	7418	7400	7381	7363	7344	7325	7307	7289
59.00	297483	294464	297445	297426	297407	297389	297370	297352	297333	297314	297296	297278
10	7472	7453	7434	7415	7396	7378	7359	7341	7322	7303	7285	7266
20	7461	7442	7423	7404	7385	7367	7348	7329	7310	7291	7273	7255
30	7450	7431	7412	7393	7374	7355	7336	7318	7299	7280	7262	7243
40	7439	7420	7401	7382	7363	7344	7325	7307	7288	7269	7251	7232
50	7428	7409	7390	7371	7352	7333	7314	7295	7276	7257	7239	7220
60.09	297417	297398	297379	297360	297341	297322	297203	297284	297265	297246	297228	297209
10	7406	7387	7368	7349	7330	7311	7292	7273	7254	7235	7216	7197
20	7395	7376	7357	7338	7319	7300	7281	7262	7242	7223	7205	7186
30	7384	7365	7346	7327	7307	7288	7269	7250	7231	7212	7193	7174
40	7273	7354	7335	7316	7296	7277	7258	7239	7220	7201	7182	7163
50	7362	7343	7324	7305	7285	7266	7247	7228	7208	7189	7170	7151
61.00	297352	297332	297313	297294	297274	297255	297236	297217	297197	297178	297159	297140
10	7341	7321	7302	7283	7363	7244	7225	7206	7186	7167	7147	7128
20	7330	7310	7291	7272	7252	7233	7214	7195	7174	7155	7136	7117
30	7319	7299	7280	7261	7240	7221	7202	7183	7163	7144	7124	7105
40	7308	7288	7269	7250	7229	7210	7191	7172	7152	7133	7113	7094
50	7297	7277	7258	7239	7218	7199	7182	7161	7140	7121	7101	7082

TABLE XXXV.

LUNI-SOLAR TABLE,

For clearing the Angular Distance between the Sun, Moon, and Stars, from the effect of Refraction and Parallax.

	Moon's Apparent Altitude.						Moon's Apparent Altitude.				
	32°						33°				
h. p. ′ ″	00′	10′	20′	30′	40′	50′	00′	10′	20′	30′	40′
53.00	297674	297657	297640	297623	297607	297590	295573	297558	297541	297524	297509
10	7662	7645	7628	7611	7595	7578	7561	7546	7529	7512	7497
20	7650	7633	7616	7599	7584	7567	7550	7534	7517	7500	7485
30	7639	7622	7605	7588	7572	7555	7538	7523	7506	7489	7473
40	7627	7610	7593	7576	7560	7543	7526	7511	7494	7477	7461
50	7616	7599	7582	7565	7549	7532	7515	7499	7485	7465	7449
54.00	297604	297587	297570	297554	297537	297520	297504	297487	297470	297454	297437
10	7592	7575	7558	7542	7525	7508	7491	7475	7458	7441	7425
20	7581	7564	7547	7529	7514	7497	7480	7463	7447	7429	7413
30	7569	7552	7535	7517	7502	7485	7468	7451	7434	7417	7401
40	7558	7541	7524	7506	7490	7473	7456	7420	7423	7406	7389
50	7546	7529	7512	7594	7479	7462	7445	7438	7411	7394	7377
55.00	297535	297518	297501	297484	297467	297450	297433	297416	297399	297382	297365
10	7523	7506	7489	7472	7455	7438	7421	7404	7387	7370	7353
20	7512	7495	7478	7461	7443	7426	7409	7392	7375	7358	7341
30	7500	7483	7466	7449	7431	7414	7397	7380	7363	7346	7329
40	7489	7472	7454	7437	7420	7403	7386	7369	7351	7334	7317
50	7477	7460	7443	7426	7408	7391	7374	7357	7339	7322	7305
56.00	297466	297449	297431	297414	297396	297379	207362	297345	297327	297310	297393
10	7455	7437	7419	7401	7384	7367	7350	7333	7315	7297	7281
20	7444	7426	7408	7390	7373	7356	7339	7321	7303	7286	7269
30	7432	7414	7396	7378	7361	7344	7327	7309	7291	7274	7257
40	7421	7402	7385	7367	7349	7332	7315	7297	7280	7263	7245
50	7409	7391	7373	7355	7338	7321	7304	7285	7268	7251	7233
57.00	297397	297379	297362	297344	297326	297309	297291	297273	297255	297238	297221
10	7384	7367	7350	7333	7314	7297	7280	7261	7244	7227	7209
20	7373	7356	7339	7322	7303	7285	7268	7249	7232	7215	7197
30	7361	7344	7327	7310	7291	7273	7256	7237	7220	7203	7185
40	7350	7333	7315	7298	7279	7262	7245	7226	7208	7191	7173
50	7338	7321	7304	7287	7268	7250	7233	7214	7196	7179	7161
58.00	297328	297310	297392	297274	297256	297238	297220	297202	297184	297167	297149
10	7316	7298	7280	7262	7244	7226	7208	7190	7172	7154	7137
20	7305	7287	7269	7251	7233	7215	7197	7178	7160	7142	7125
30	7293	7275	7257	7239	7221	7203	7185	7166	7148	7130	7113
40	7282	7264	7245	7227	7209	7191	7173	7155	7137	7119	7101
50	7270	7252	7234	7216	7198	7180	7162	7143	7125	7107	7089
59.00	297259	297241	297222	297204	297186	297168	297149	297131	297113	297095	297077
10	7248	7229	7210	7191	7174	7156	7138	7119	7101	7083	7065
20	7237	7218	7199	7180	7162	7144	7126	7107	7089	7071	7053
30	7225	7206	7187	7168	7150	7132	7114	7095	7077	7059	7041
40	7213	7194	7176	7157	7139	7121	7103	7084	7065	7047	7029
50	7202	7183	7164	7145	7127	7109	7091	7072	7053	7035	7017
60.00	297190	297171	297153	297134	297115	297097	297078	297060	297041	297023	297002
10	7177	7159	7141	7123	7103	7085	7067	7048	7029	7010	6993
20	7166	7148	7130	7112	7092	7073	7055	7036	7017	6998	6981
30	7154	7136	7118	7100	7080	7061	7043	7024	7005	6986	6969
40	7143	7125	7106	7089	7068	7050	7032	7013	6993	6974	6957
50	7132	7113	7095	7077	7057	7038	7020	7001	6981	6962	6945
61.00	297121	297102	297083	297064	297045	297026	297008	296989	296970	296951	296933
10	7109	7090	7071	7052	7033	7014	6995	6977	6958	6939	6921
20	7098	7079	7060	7041	7022	7002	6984	6965	6946	6927	6909
30	7086	7067	7048	7029	7010	6990	6972	6952	6934	6915	6897
40	7075	7056	7036	7017	6998	6979	6961	6942	6922	6903	6885
50	7063	7044	7025	7006	6987	6967	6949	6930	6910	6891	6873

LUNI-SOLAR TABLE,

For clearing the Angular Distance between the Sun, Moon, and Stars, from the effect of Refraction and Parallax.

	Moon's Apparent Altitude.						Moon's Apparent Altitude.					
	34°						35°					
p.	00′	10′	20′	30′	40′	50′	00′	10′	20′	30′	40′	50′
′ ″												
3.00	297477	297466	297445	297429	297412	297397	297381	297363	297348	297332	297316	297298
10	7465	7449	7433	7417	7400	7385	7369	7351	7336	7320	7304	7286
20	7453	7437	7421	7405	7388	7372	7356	7339	7323	7307	7291	7274
30	7441	7425	7409	7393	7376	7360	7344	7327	7311	7295	7279	7262
40	7428	7412	7396	7380	7363	7348	7332	7314	7399	7283	7267	7249
50	7416	7400	7384	7368	7351	7335	7319	7302	7286	7270	7254	7237
54.00	297404	297388	297372	297355	297339	297323	297306	297290	297274	297258	297242	297225
10	7392	7376	7360	7344	7327	7311	7295	7278	7262	7246	7230	-7213
20	7380	7364	7348	7332	7315	7298	7282	7266	7249	7233	7217	7201
30	7367	7351	7335	7319	7302	7286	7270	7253	7237	7221	7205	7188
40	7355	7339	7323	7307	7290	7274	7258	7241	7225	7209	7193	7176
50	7343	7327	7311	7295	7278	7261	7245	7229	7212	7196	7180	7164
55.00	297332	297315	297299	297282	297266	297249	297232	297215	297199	297182	297166	297150
10	7320	7303	7286	7269	7253	7236	7219	7192	7186	7170	7154	7138
20	7308	7291	7274	7257	7241	7224	7207	7180	7174	7158	7141	7125
30	7295	7278	7261	7244	7228	7211	7194	7177	7161	7145	7128	7102
40	7283	7266	7249	7232	7216	7199	7182	7165	7149	7133	7115	7099
50	7271	7254	7237	7220	7203	7186	7169	7152	7136	7120	7103	7087
56.00	297257	297242	297225	297208	297191	297174	297157	297140	297124	297107	297090	297073
10	7247	7230	7213	7196	7179	7162	7145	7128	7112	7096	6978	7061
20	7233	7216	7199	7182	7167	7150	7133	7115	7099	7083	6965	7048
30	7222	7205	7188	7171	7154	7147	7120	7102	7086	7070	6952	7035
40	7210	7193	7176	7159	7142	7125	7108	7090	7074	7058	6939	7022
50	7198	7181	7164	7147	7129	7112	7095	7075	7059	7043	6927	7010
7.00	297186	297169	297152	297134	297117	297100	297083	297066	297048	297031	296914	296997
10	7174	7157	7140	7122	7105	7088	7071	7053	7035	7018	6901	6984
20	7162	7145	7128	7110	7093	7076	7059	7041	7023	7006	6989	6962
30	7150	7133	7116	7098	7080	7063	7046	7028	7010	6993	6976	6959
40	7138	7121	7104	7086	7068	7051	7034	7016	6998	6981	6964	6947
50	7126	7109	7092	7074	7055	7038	7021	7003	6985	6968	6951	6934
58.00	297114	297096	297078	297061	297043	297026	297008	296991	296973	296956	296939	296921
10	7102	7084	7066	7048	7031	7014	6997	6978	6960	6942	6927	6909
20	7090	7072	7054	7036	7019	7002	6985	6966	6948	6930	6914	6896
30	7077	7059	7032	7023	7006	6989	6972	6953	6935	6917	6901	6883
40	7065	7047	7029	7011	6994	6975	6958	6941	6923	6905	6888	6870
50	7053	7035	7017	6999	6980	6963	6946	6928	6910	6892	6876	6858
9.00	297041	297023	297005	296987	296969	296951	296934	296916	296898	296880	296863	296845
10	7029	7011	6993	6975	6957	6939	6921	6903	6885	6867	6851	6833
20	7017	6999	6981	6963	6944	6925	6907	6891	6873	6855	6838	6820
30	7004	6986	6968	6950	6932	6913	6895	6878	6860	6842	6825	6807
40	6992	6974	6956	6938	6920	6901	6883	6866	6848	6830	6812	6795
50	6980	6962	6944	6926	6907	6888	6870	6853	6835	6817	6800	6782
0.00	296968	296950	296932	296914	296895	296877	296859	296841	296823	296805	296787	296769
10	6956	6938	6920	6902	6883	6865	6847	6828	6810	6792	6774	6756
20	6944	6926	6908	6890	6871	6853	6835	6816	6798	6780	6762	6744
30	6932	6914	6896	6878	6858	6840	6822	6803	6785	6767	6749	6731
40	6920	6902	6884	6866	6846	6828	6810	6791	6773	6755	6736	6718
50	6908	6891	6872	6854	6834	6816	6798	6778	6760	6742	6724	6706
1.00	296896	296877	296858	296840	296821	296803	296785	296766	296748	296730	296711	296693
10	6884	6865	6847	6828	6809	6791	6773	6753	6735	6717	6698	6680
20	6872	6853	6835	6816	6797	6779	6761	6741	6723	6705	6686	6668
30	6860	6841	6823	6804	6784	6766	6743	6728	6710	6692	6673	6655
40	6848	6829	6811	6792	6772	6754	6736	6716	6698	6680	6660	6642
50	6836	6817	6799	6780	6760	6742	6724	6703	6685	6667	6648	6630

TABLE XXXV.

LUNI-SOLAR TABLE,

For clearing the Angular Distance between the Sun, Moon, and Stars, from
the effect of Refraction and Parallax.

	Moon's Apparent Altitude.						Moon's Apparent Altitude.					
	36°						37°					
h· p. ′ ″	00′	10′	20′	30′	40′	50′	00′	10′	20′	30′	40′	50′
53.00	297382	297366	297350	297334	297318	297301	297284	297269	297254	297238	297222	[illegible]
10	7369	7353	7337	7321	7305	7288	7271	7256	7241	7225	7209	[illegible]
20	7356	7340	7324	7308	7293	7276	7259	7244	7228	7212	7196	[illegible]
30	7344	7328	7312	7296	7280	7263	7246	7231	7216	7199	7184	[illegible]
40	7331	7315	7299	7283	7267	7250	7233	7218	7203	7187	7171	[illegible]
50	7319	7303	7287	7271	7255	7238	7221	7206	7190	7174	7158	[illegible]
54.00	297306	297290	297274	297258	297242	297225	297209	297193	297177	297161	297145	[illegible]
10	7293	7277	7262	7245	7229	7212	7196	7180	7164	7148	7132	[illegible]
20	7281	7265	7249	7233	7217	7200	7184	7168	7151	7135	7119	[illegible]
30	7268	7252	7236	7220	7204	7187	7171	7155	7138	7122	7106	[illegible]
40	7256	7240	7224	7208	7191	7174	7158	7142	7126	7110	7094	[illegible]
50	7233	7227	7211	7195	7179	7162	7146	7130	7113	7097	7081	[illegible]
55.00	297232	297215	297199	297182	297166	297149	297133	297117	297100	297084	297068	[illegible]
10	7219	7202	7186	7169	7153	7136	7120	7104	7087	7071	7055	[illegible]
20	7207	7190	7174	7157	7141	7124	7108	7091	7074	7058	7042	[illegible]
30	7195	7183	7161	7145	7128	7111	7095	7078	7061	7045	7029	[illegible]
40	7182	7165	7149	7132	7115	7098	7082	7066	7049	7033	7016	[illegible]
50	7169	7152	7136	7119	7103	7085	7069	7053	7036	7020	7003	[illegible]
56.00	297157	297140	297124	297107	297090	297073	297057	297040	297023	297007	296990	[illegible]
10	7145	7128	7117	7094	7077	7060	7044	7027	7010	6994	6977	[illegible]
20	7132	7115	7099	7082	7065	7048	7032	7014	6998	6982	6964	[illegible]
30	7120	7103	7086	7069	7052	7035	7019	7001	6985	6969	6951	[illegible]
40	7108	7091	7073	7056	7039	7022	7006	6989	6972	6956	6939	[illegible]
50	7095	7078	7061	7044	7027	7010	6994	6976	6960	6944	6926	[illegible]
57.00	297083	297066	297048	297031	297014	296997	296980	296963	296947	296930	296913	[illegible]
10	7095	7053	7035	7018	7001	6984	6967	6950	6934	6917	6900	[illegible]
20	7058	7041	7023	7006	6989	6972	6955	6938	6921	6904	6897	[illegible]
30	7045	7028	7010	6993	6976	6959	6942	6925	6908	6891	6874	[illegible]
40	7033	7016	6998	6971	6964	6946	6929	6912	6896	6879	6861	[illegible]
50	7020	7003	6985	6968	6951	6934	6917	6900	6883	6866	6848	[illegible]
58.00	297008	296991	296973	296956	296939	296921	296904	296887	296870	296852	296835	[illegible]
10	6995	6978	6960	6943	6923	6908	6891	6874	6857	6839	6822	[illegible]
20	6983	6966	6948	6931	6914	6896	6879	6861	6844	6826	6809	[illegible]
30	6970	6953	6935	6918	6901	6883	6866	6848	6831	6813	6796	[illegible]
40	6957	6940	6923	6906	6888	6870	6853	6836	6819	6801	6784	[illegible]
50	6945	6928	6910	6893	6876	6858	6841	6823	6806	6788	6771	[illegible]
59.00	296934	296916	296898	296880	296863	296845	296828	296810	296793	296775	296758	[illegible]
10	6920	6903	6885	6867	6850	6832	6815	6797	6780	6762	6745	[illegible]
20	6908	6891	6873	6855	6838	6820	6803	6785	6767	6749	6732	[illegible]
30	6895	6878	6860	6842	6825	6807	6790	6772	6754	6736	6719	[illegible]
40	6883	6866	6848	6830	6812	6794	6777	6759	6742	6724	6706	[illegible]
50	6870	6853	6835	6817	6800	6782	6765	6747	6729	6711	6693	[illegible]
60.00	296859	296841	296823	296805	296787	296769	296751	296734	296716	296698	296680	[illegible]
10	6846	6828	6810	6792	6774	6756	6738	6721	6703	6685	6667	[illegible]
20	6831	6816	6798	6780	6762	6744	6726	6708	6690	6672	6654	[illegible]
30	6821	6803	6785	6768	6749	6731	6713	6695	6677	6659	6641	[illegible]
40	6809	6791	6773	6755	6736	6718	6700	6683	6665	6647	6629	[illegible]
50	6796	6778	6760	6742	6724	6706	6688	6670	6652	6634	6616	[illegible]
61.00	296785	296766	296748	296730	296711	296693	296675	296657	296639	296621	296603	[illegible]
10	6772	6753	6735	6717	6698	6680	6662	6644	6626	6608	6590	[illegible]
20	6760	6741	6723	6705	6686	6668	6650	6631	6613	6595	6577	[illegible]
30	6747	6728	6710	6692	6673	6655	6637	6618	6600	6582	6564	[illegible]
40	6735	6716	6698	6680	6660	6642	6624	6606	6588	6570	6552	[illegible]
50	6722	6703	6685	6667	6648	6630	6612	6593	6575	6557	6539	[illegible]

TABLE XXXV.

LUNI-SOLAR TABLE,

For clearing the Angular Distance between the Sun, Moon, and Stars, from the effect of Refraction and Parallax.

	Moon's Apparent Altitude.						Moon's Apparent Altitude.					
	38°						39°					
h. p.	00′	10′	20′	30′	40′	50′	00′	10′	20′	30′	40′	50′
′ ″												
53.00	297099	297083	297070	297054	297039	297023	297008	296992	296977	296961	296946	296931
10	7086	7070	7056	7040	7021	7009	6994	6978	6963	6947	6932	6917
20	7072	7056	7042	7026	7011	6995	6980	6965	6950	6934	6919	6904
30	7059	7043	7029	7013	6998	6982	6967	6951	6936	6920	6906	6891
40	7046	7030	7015	6999	6984	6968	6953	6937	6922	6906	6892	6877
50	7032	7016	7002	6986	6971	6955	6940	6924	6909	6893	6878	6863
54.00	297019	297003	296988	296972	296957	296941	296926	296910	296895	296879	296864	296849
10	7006	6990	6974	6958	6943	6927	6912	6896	6883	6867	6850	6835
20	6992	6976	6961	6945	6930	6914	6898	6883	6868	6842	6836	6821
30	6979	6963	6947	6921	6916	6900	6884	6869	6854	6838	6822	6807
40	6966	6950	6934	6918	6903	6887	6871	6855	6840	6824	6809	6794
50	6952	6936	6920	6904	6889	6873	6857	6842	6827	6811	6796	6781
55.00	296939	296923	296907	296892	296876	296860	296844	296828	296813	296797	296781	296766
10	6926	6910	6893	6878	6862	6846	6830	6814	6799	6783	6767	6752
20	6912	6896	6880	6865	6849	6832	6817	6801	6786	6770	6754	6738
30	6899	6883	6867	6851	6835	6819	6803	6787	6772	6756	6740	6724
40	6886	6870	6854	6838	6822	6806	6790	6773	6758	6742	6726	6711
50	6872	6856	6840	6824	6808	6792	6776	6760	6745	6729	6713	6698
56.00	296859	296843	296827	296811	296795	296779	296763	296746	296731	296715	296699	296683
10	6846	6830	6814	6798	6781	6765	6749	6732	6717	6701	6683	6669
20	6832	6816	6800	6784	6768	6752	6736	6719	6703	6687	6671	6655
30	6819	6803	6787	6781	6754	6738	6712	6705	6689	6673	6657	6641
40	6806	6790	6774	6758	6741	6724	6708	6692	6676	6660	6644	6628
50	6792	6776	6760	6744	6727	6711	6695	6679	6663	6647	6631	6615
7.00	296780	296763	296747	296730	296714	296697	296681	296665	296648	296632	296616	296600
10	6767	6750	6733	6716	6700	6683	6667	6651	6634	6618	6602	6586
20	6753	6736	6720	6703	6687	6670	6654	6638	6621	6605	6588	6572
30	6740	6723	6706	6689	6673	6656	6640	6624	6607	6591	6574	6558
40	6727	6710	6693	6676	6660	6643	6627	6510	6593	6577	6561	6545
50	6713	6696	6679	6652	6646	6629	6613	6597	6580	6564	6548	6532
8.00	296700	296683	296666	296647	296633	296616	296599	296583	296566	296550	296533	296517
10	6687	6670	6653	6636	6619	6602	6585	6569	6552	6536	6519	6503
20	6673	6656	6639	6612	6606	6589	6572	6536	6539	6523	6506	6489
30	6660	6643	6626	6609	6592	6575	6558	6542	6525	6509	6492	6475
40	6647	6630	6613	6596	6579	6562	6545	6528	6511	6495	6478	6462
50	6633	6616	6599	6572	6565	6548	6531	6515	6498	6481	6465	6449
9.00	296620	296603	296586	296569	296552	296535	296518	296501	296484	296467	296451	296434
10	6607	6590	6572	6555	6538	6521	6504	6487	6470	6453	6437	6420
20	6593	6576	6559	6542	6525	6508	6491	6474	6457	6440	6423	6406
30	6580	6563	6545	6528	6511	6494	6477	6460	6443	6426	6409	6392
40	6567	6550	6532	6515	6498	6480	6463	6446	6429	6412	6396	6379
50	6553	6536	6518	6501	6484	6467	6450	6433	6416	6399	6383	6366
0.00	296540	296523	296505	296488	296471	296453	296436	296419	296402	296385	296368	296351
10	6527	6510	6492	6475	6457	6439	6412	6405	6388	6371	6354	6337
20	6513	6496	6478	6461	6444	6426	6409	6392	6375	6358	6340	6323
30	6500	6483	6465	6448	6430	6412	6395	6378	6361	6344	6326	6309
40	6487	6470	6452	6435	6416	6399	6382	6364	6347	6330	6313	6295
50	6473	6456	6438	6421	6403	6385	6368	6351	6334	6317	6300	6283
1.00	296460	296443	296425	296407	296389	296372	296355	296337	296320	296303	296285	296268
10	6447	6430	6412	6394	6375	6358	6341	6323	6306	6289	6271	6254
20	6433	6416	6398	6380	6362	6345	6328	6310	6293	6274	6257	6240
30	6420	6403	6385	6367	6348	6331	6314	6290	6279	6262	6243	6226
40	6407	6390	6372	6354	6334	6318	6301	6282	6265	6248	6230	6213
50	6393	6376	6358	6340	6321	6304	6287	6269	6252	6235	6217	6200

TABLE XXXV.

LUNI-SOLAR TABLE,

For clearing the Angular Distance between the Sun, Moon, and Stars, from the effect of Refraction and Parallax.

	Moon's Apparent Altitude.						Moon's Apparent Altitude.				
	40°						41°				
h. p.	00′	10′	20′	30′	40′	50′	00′	10′	20′	30′	40′
′ ″											
53.00	296917	296902	296887	296872	296857	296842	296827	296812	296797	296782	296767
10	6904	6888	6873	6858	6843	6828	6813	6798	6783	6768	6753
20	6890	6874	6859	6844	6829	6814	6799	6784	6769	6754	6739
30	6876	6860	6845	6830	6815	6800	6785	6770	6755	6740	6725
40	6862	6846	6831	6816	6801	6786	6771	6756	6741	6726	6711
50	6848	6832	6817	6802	6787	6772	6756	6742	6727	6712	6697
54.00	296834	296818	296803	296788	296773	296758	296743	296728	296713	296698	296683
10	6820	6805	6790	6774	6759	6743	6728	6713	6698	6683	6668
20	6806	6791	6776	6761	6746	6730	6715	6699	6684	6669	6654
30	6792	6777	6762	6746	6731	6715	6700	6685	6670	6655	6640
40	6778	6763	6748	6732	6717	6701	6686	6671	6656	6641	6626
50	6764	6749	6734	6718	6703	6687	6672	6657	6642	6626	6611
55.00	296750	296735	296720	296704	296689	296673	296658	296643	296628	296612	296597
10	6737	6721	6706	6690	6674	6659	6643	6629	6613	6599	6583
20	6723	6707	6692	6676	6660	6645	6629	6615	6599	6584	6568
30	6709	6683	6668	6662	6646	6631	6615	6600	6584	6570	6554
40	6695	6679	6664	6648	6632	6617	6601	6586	6570	6555	6539
50	6681	6665	6650	6634	6618	6603	6587	6572	6556	6541	6525
56.00	296667	296651	296636	296620	296604	296589	296573	296558	296542	296527	296511
10	6654	6638	6622	6606	6590	6575	6558	6543	6527	6512	6496
20	6640	6624	6608	6592	6576	6551	6541	6529	6513	6498	6482
30	6626	6610	6594	6578	6562	6547	6530	6515	6499	6484	6467
40	6612	6596	6580	6564	6548	6533	6516	6591	6485	6470	6453
50	6698	6582	6576	6550	6534	6519	6502	6487	6471	6456	6439
57.00	296584	296568	296552	296536	296520	296504	296488	296472	296457	296441	296435
10	6570	6554	6538	6522	6505	6489	6473	6457	6442	6426	6410
20	6558	6540	6524	6508	6491	6475	6459	6443	6428	6412	6396
30	6542	6526	6510	6494	6177	6461	6145	6429	6413	6397	6382
40	6528	6512	6496	6180	6463	6447	6431	6415	6399	6383	6368
50	6514	6498	6482	6466	6449	6433	6417	6401	6385	6369	6354
58.00	296500	296484	296468	296452	296435	296419	296403	296387	296371	296355	296339
10	6486	6470	6454	6438	6421	6405	6388	6372	6356	6340	6324
20	6472	6456	6440	6424	6407	6391	6374	6358	6342	6326	6310
30	6458	6442	6426	6410	6393	6377	6360	6344	6328	6312	6295
40	6444	6428	6412	6396	6379	6363	6346	6330	6314	6298	6281
50	6430	6414	6398	6382	6365	6349	6332	6316	6300	6284	6267
59.00	296417	296441	296384	296368	296351	295335	296318	296302	296286	296229	296253
10	6403	6387	6370	6354	6337	6321	6303	6287	6271	6254	6238
20	6489	6373	6356	6340	6323	6307	6289	6273	6257	6243	6224
30	6475	6359	6342	6326	6309	6293	6275	6259	6243	6226	6209
40	6461	6345	6328	6312	6295	6279	6261	6245	6228	6211	6195
50	6447	6331	6314	6298	6281	6265	6247	6231	6214	6197	6181
60.00	296334	296317	296300	296283	296267	296250	296233	296217	296200	296184	296167
10	6320	6303	6286	6269	6252	6235	6218	6202	6185	6169	6152
20	6306	6289	6272	6255	6238	6221	6204	6188	6171	6155	6138
30	6292	6275	6258	9241	6224	6207	6190	6174	6157	6141	6123
40	6278	6261	6244	6227	6210	6193	6176	6150	6143	6127	6109
50	6264	6247	6230	6213	6199	6179	6162	6148	6129	6113	6095
61.00	296251	296233	296216	296199	296182	296165	296148	296131	296115	296098	296081
10	6236	6217	6202	6185	6168	6151	6133	6116	6100	6083	6066
20	6222	6205	6188	6171	6154	6137	6119	6102	6086	6069	6052
30	6208	6191	6174	6157	6140	6123	6105	6088	6072	6055	6038
40	6194	6177	6160	6143	6126	6109	6091	6074	6058	6041	6024
50	6180	6163	6145	6129	6112	6095	6077	6060	6044	6027	6010

TABLE XXXV.

LUNI-SOLAR TABLE,

For clearing the Angular Distance between the Sun, Moon, and Stars, from the effect of Refraction and Parallax.

	Moon's Apparent Altitude.						Moon's Apparent Altitude.					
	42°						43°					
h. p.	00′	10′	20′	30′	40′	50′	00′	10′	20′	30′	40′	50′
′ ″												
53.00	296742	296727	296713	296698	296684	296669	296654	296642	296627	296613	296598	296584
10	6727	6712	6698	6683	6669	6654	6639	6627	6612	6598	6583	6569
20	6712	6697	6683	6668	6654	6639	6624	6612	6597	6583	6568	6554
30	6698	6683	6669	6654	6639	6624	6610	6597	6582	6568	6553	6539
40	6683	6668	6654	6639	6625	6610	6595	6582	6567	6553	6538	6524
50	6668	6653	6640	6625	6611	6596	6581	6566	6552	6538	6523	6509
54.00	296654	296639	296624	296610	296595	296581	296566	296552	296537	296523	296508	296494
10	6639	6624	6610	6595	6581	6566	6551	6537	6522	6508	6493	6479
20	6625	6610	6596	6581	6567	6552	6537	6522	6507	6493	6478	6464
30	6610	6595	6581	6566	6552	6537	6522	6507	6492	6478	6463	6449
40	6596	6581	6567	6552	6538	6523	6508	6492	6477	6463	6458	6434
50	6581	6566	6552	6537	6523	6508	6493	6477	6462	6448	6433	6419
55.00	296567	296552	296537	296522	296507	296493	296478	296463	296448	296434	296419	296404
10	6552	6537	6522	6507	6493	6478	6463	6448	6433	6419	6404	6389
20	6538	6523	6508	6493	6479	6464	6449	6433	6418	6404	6389	6374
30	6523	6508	6493	6478	6464	6449	6434	6418	6403	6388	6374	6359
40	6509	6494	6479	6464	6450	6435	6420	6403	6388	6373	6359	6344
50	6494	6479	6464	6449	6435	6420	6405	6388	6373	6358	6344	6329
56.00	296480	296465	296450	296435	296420	296405	296390	296375	296360	296345	296330	296315
10	6465	6450	6435	6420	6405	6390	6375	6360	6345	6330	6314	6300
20	6451	6436	6421	6406	6391	6376	6361	6345	6330	6315	6300	6285
30	6436	6421	6406	6391	6376	6361	6346	6330	6315	6300	6285	6270
40	6422	6407	6392	6377	6362	6347	6332	6315	6300	6285	6270	6255
50	6407	6392	6377	6362	6347	6332	6317	6300	6285	6270	6255	6240
57.00	296394	296378	296363	296348	296332	296317	296302	296286	296271	296256	296240	296225
10	6379	6363	6348	6333	6317	6302	6287	6271	6256	6241	6225	6210
20	6365	6349	6334	6319	6303	6288	6273	6256	6241	6226	6210	6195
30	6350	6334	6319	6304	6288	6273	6258	6241	6226	6210	6195	6180
40	6336	6320	6305	6290	6274	6259	6244	6226	6211	6196	6180	6165
50	6321	6305	6290	6275	6259	6244	6229	6211	6196	6181	6165	6151
58.00	296307	296292	296276	296260	296244	296229	296213	296198	296182	296167	296151	296136
10	6292	6277	6261	6245	6229	6214	6198	6183	6167	6153	6136	6121
20	6278	6263	6247	6231	6215	6200	6184	6168	6152	6137	6121	6106
30	6263	6248	6232	6216	6200	6185	6169	6153	6137	6122	6106	6091
40	6249	6234	6218	6202	6186	6171	6155	6138	6122	6107	6091	6076
50	6234	6219	6203	6187	6171	6156	6140	6113	6107	6092	6076	6061
.00	296221	296205	296189	296173	296157	296141	296125	256109	296093	296078	296062	296046
10	6206	6190	6174	6158	6142	6126	6110	6094	6078	6063	6047	6031
20	6192	6176	6160	6144	6128	6112	6096	6079	6063	6048	6032	6006
30	6177	6161	6145	6129	6114	6098	6081	6064	6048	6033	6017	5991
40	6163	6147	6131	6115	6100	6083	6067	6049	6033	6018	6002	5976
50	6148	6132	6116	6100	6084	6068	6052	6034	6018	6003	5987	5962
-00	296134	296118	296102	296085	246069	296053	296037	296021	296005	295989	295973	295957
10	6119	6103	6087	6070	6054	6038	6022	6006	5990	5974	5958	5942
20	6105	6089	6073	6056	6040	6024	6008	5991	5975	5959	5943	5927
30	6090	6074	6058	6041	6025	6009	5993	5976	5960	5944	5928	5912
40	6076	6060	6044	6027	6011	5995	5979	5961	5945	5029	5913	5897
50	6061	6045	6029	6012	5996	5980	5964	5946	5930	5914	5898	5872
.00	296048	296031	296014	295998	295981	295965	295948	295932	295916	295900	295883	295867
10	6033	6016	5999	5983	5966	5950	5933	5917	5901	5885	5868	5852
20	6019	6002	5985	5969	5952	5986	5919	5902	5886	5870	5853	5837
30	6004	5987	5970	5954	5937	5921	5904	5887	5871	5855	5838	5822
40	5990	5973	5956	5940	5923	5907	5890	5872	5856	5840	5823	5707
50	5975	5958	5941	5925	5908	5892	5875	5857	5841	5825	5808	5792

TABLE XXXV.

LUNI-SOLAR TABLE,

For clearing the Angular Distance between the Sun, Moon, and Stars, the effect of Refraction and Parallax.

	Moon's Apparent Altitude.						Moon's Apparent Altitude.				
	44°						45°				
h. p.	00′	10′	20′	30′	40′	50′	00′	10′	20′	30′	40′
′ ″											
53.00	296569	296555	296541	296527	296513	296499	296485	296471	296457	296443	29642
10	6554	6540	6526	6512	6498	6484	6470	6456	6442	6428	641
20	6539	6525	6511	6497	6483	6469	6455	6441	6427	6413	639
30	6524	6510	6496	6482	6468	6454	6440	6426	6412	6398	638
40	6509	6495	6481	6467	6453	6439	6425	6411	6397	6383	636
50	6494	6480	6466	6452	6438	6424	6410	6396	6382	6368	635
54.00	296480	296465	296451	296437	296423	296409	296395	296381	296367	296353	29633
10	6464	6450	6436	6423	6408	6394	6384	6366	6352	6338	63
20	6449	6435	6421	6407	6393	6379	6365	6351	6337	6323	63
30	6434	6420	6406	6391	6377	6363	6349	6335	6321	6307	62
40	6419	6405	6391	6376	6362	6348	6334	6320	6306	6292	62
50	6404	6390	6376	6361	6347	6333	6319	6305	6291	6277	62
55.00	296390	296375	296361	296346	296332	296318	296303	296289	296275	296261	2962
10	6374	6360	6346	6331	6317	6303	6288	6274	6260	6246	62
20	6359	6345	6331	6316	6302	6288	6273	6259	6245	6231	6
30	6344	6330	6316	6301	6287	6273	6258	6244	6230	6216	6
40	6329	6315	6301	6286	6272	6258	6243	6229	6215	6201	6
50	6314	6300	6286	6271	6257	6243	6228	6214	6200	6186	6
56.00	296300	296285	296270	296256	296241	296227	296212	296198	296183	296168	296
10	6285	6270	6255	6241	6226	6212	6197	6183	6168	6153	6
20	6270	6255	6240	6226	6211	6197	6182	6168	6153	6138	6
30	6255	6240	6225	6210	6195	6181	6166	6152	6137	6122	6
40	6240	6225	6210	6195	6180	6166	6151	6137	6122	6107	6
50	6225	6210	6195	6180	6165	6151	6136	6122	6107	6092	6
57.00	296210	296195	296180	296165	296150	296135	296121	296106	296090	296076	296
10	6195	6180	6165	6150	6135	6120	6106	6091	6075	6061	6
20	6180	6165	6150	6135	6120	6105	6091	6076	6060	6046	6
30	6165	6150	6135	6120	6105	6090	6076	6061	6045	6031	6
40	6150	6135	6120	6105	6090	6075	6061	6046	6030	6016	6
50	6135	6120	6105	6090	6075	6060	6046	6031	6015	6001	5
58.00	296120	296105	296090	296075	296059	296044	296029	296014	295999	295984	2959
10	6105	6090	6075	6060	6044	6029	6014	5999	5984	5969	59
20	6090	6075	6060	6045	6029	6014	5999	5984	5969	5954	59
30	6075	6060	6045	6029	6013	6998	5983	5968	5953	5938	59
40	6060	6045	6030	6014	5998	5983	5968	5953	5938	5923	590
50	6045	6030	6015	5999	5983	5968	5953	5938	5923	5908	589
59.00	296030	296015	295999	295984	295968	295953	295938	295922	295907	295892	29587
10	6016	6000	5984	5969	5953	5938	5923	5907	5892	5877	586
20	6001	5985	5969	5954	5938	5923	5908	5892	5877	5862	584
30	5986	5970	5954	5938	5922	5907	5892	5876	5861	5846	583
40	5971	5955	5939	5923	5907	5892	5877	5861	5846	5831	581
50	5956	5940	5924	5908	5892	5877	5862	5846	5831	5816	580
60.00	295941	295925	295969	295893	295878	295862	295846	295831	295815	295800	295784
10	5926	5910	5894	5878	5863	5847	5831	5816	5800	5785	5770
20	5911	5895	5879	5863	5848	5832	5816	5801	5785	5770	5755
30	5896	5880	5864	5848	5833	5817	5801	5786	5770	5755	5740
40	5880	5865	5849	5833	5818	5802	5786	5771	5755	5740	4725
50	5866	5850	5834	5818	5803	5787	5771	5756	5740	5725	5710
61.00	295851	295835	295819	295803	295787	295771	295755	295739	295723	295707	295692
10	5836	5820	5804	5788	5772	5756	5740	5724	5708	5692	5676
20	5821	5805	5789	5773	5757	5741	5725	5709	5693	5677	5661
30	5806	5790	5774	5758	5742	5726	5710	5694	5678	5662	5646
40	5791	5775	5759	5743	5727	5711	5695	5679	5663	5647	5631
50	5776	5760	5744	5728	5712	5696	5680	5664	5648	5632	5616

TABLE XXXV.

LUNI-SOLAR TABLE,

For clearing the Angular Distance between the Sun, Moon, and Stars, fr the effect of Refraction and Parallax.

	Moon's Apparent Altitude.						Moon's Apparent Altitude.					
	46°						47°					
h. p.	00′	10′	20′	30′	40′	50′	00′	10′	20	30′	40′	
′ ″												
53.00	296405	296391	296378	296364	296350	296337	296325	296311	296297	296283	296270	29
10	6389	6375	7362	6348	6334	6321	6309	6295	6281	6267	6254	
20	6373	6359	6346	6332	6319	6306	6293	6279	6265	6251	6238	
30	6358	6344	6331	6317	6303	6290	6276	6264	6250	6236	6223	
40	6342	6328	6315	6301	6287	6274	6262	6248	6234	6220	6207	
50	6327	6313	6300	6286	6272	6259	6246	6232	6218	6204	6191	
54.00	296311	296297	296284	296270	296256	296243	296229	296216	296202	296188	296175	29
10	6295	6281	6268	6254	6240	6227	6214	6200	6186	6173	6159	
20	6280	6266	6253	6239	6225	6212	6198	6184	6170	6157	6143	
30	6264	6250	6237	6223	6209	6196	6182	6168	6154	6141	6127	
40	6249	6235	6222	6208	6194	6181	6167	6153	6139	6126	6112	
50	6232	6219	6206	6192	6178	6165	6151	6137	6123	6110	6096	
55.00	296218	296204	296190	296176	296162	296149	296135	296121	296107	296094	296080	29
10	6192	6188	6174	6160	6147	6133	6119	6105	6091	6078	6064	
20	6187	6173	6159	6145	6130	6117	6103	6089	6075	6062	6048	
30	6161	6157	6143	6129	6115	6101	6087	6073	6059	6046	6032	
40	6156	6142	6128	6114	6100	6086	6072	6058	6044	6031	6017	
50	6130	6126	6112	6098	6084	6070	6056	6042	6028	6015	6601	
56.00	296125	296111	296097	296083	296068	296054	296040	296026	296012	295998	295984	29
10	6109	6095	6081	6067	6052	6038	6024	6010	5996	5982	5968	
20	6094	6080	6066	6052	6037	6023	6008	5994	5980	5966	5952	
30	6078	6064	6050	6036	6021	6007	5992	5978	5964	5950	5936	
40	6063	6049	6035	6021	6005	5991	5977	5963	5949	5935	5921	
50	6047	6033	6019	6005	5989	5976	5961	5947	5933	5919	5905	
57.00	296032	296018	296003	295989	295974	295960	295946	295931	295917	295903	295889	29
10	6018	6002	5988	5973	5958	5944	5929	5915	5901	5887	5873	
20	6001	5987	5972	5958	5943	5929	5914	5900	5886	5872	5857	
30	5985	5971	5956	5942	5927	5913	5898	5881	5870	5856	5841	
40	5970	5956	5941	5927	5911	5897	5882	5868	5854	5840	5826	
50	5954	5940	5925	5911	5896	5882	5867	5853	5839	5825	5810	
58.00	295939	295925	295910	295895	295880	295866	295851	295837	295822	295808	295794	29
10	5924	5909	5894	5879	5864	5850	5836	5821	5806	5792	5778	
20	5908	5894	5878	5864	5849	5835	5820	5805	5790	5776	5762	
30	5892	5878	5862	5848	5833	5819	5804	5789	5773	5759	5746	
40	5877	5863	5847	5833	5817	5803	5789	5774	5758	5744	5730	
50	5861	5847	5831	5817	5802	5788	5773	5758	5742	5728	5714	
59.00	295846	295831	295816	295801	295786	295772	295757	295742	295727	295712	295698	29
10	5830	5815	5800	5785	5772	5756	5741	5726	5711	5695	5682	
20	5815	5800	5785	5770	5756	5740	5725	5710	5694	5680	5666	
30	5799	5784	5769	5754	5740	5724	5709	5694	5678	5664	5650	
40	5784	5769	5754	5739	5725	5709	5694	5679	5664	5647	5635	
50	5769	5753	5738	5723	5709	5693	5678	5663	5647	5633	5619	
60.00	295753	295738	295723	295708	295693	295677	295662	295647	295632	295610	295603	29
10	5737	5722	5707	5692	5677	5661	5646	5631	5616	5604	5587	
20	5722	5707	5692	5677	5662	5646	5631	5616	5600	5586	5571	
30	5706	5691	5676	5661	5646	5630	5615	5600	5584	5578	5555	
40	5691	5676	5661	5646	5630	5614	5599	5584	5568	5553	5539	
50	5675	5660	5645	5630	5615	5599	5584	5569	5553	5537	5523	
61.00	295660	295645	295629	295614	295599	295583	295568	295553	295537	295522	295507	29
10	5644	5629	5613	5598	5583	5567	5553	5537	5521	5506	5491	
20	5629	5614	5598	5583	5568	5552	5538	5522	5506	5490	5475	
30	5613	5598	5582	5567	5552	5536	5522	5506	5490	5474	5459	
40	5598	5583	5567	5552	5536	5520	5506	5490	5474	5460	5443	
50	5582	5567	5551	5536	5521	5505	5491	5475	5460	5446	5429	

TABLE XXXV.

LUNI-SOLAR TABLE,

For clearing the Angular Distance between the Sun, Moon, and Stars, from the effect of Refraction and Parallax.

h. p.	Moon's Apparent Altitude. 48°						Moon's Apparent Altitude. 49°					
′ ″	00′	10′	20′	30′	40′	50′	00′	10′	20′	30′	40′	50′
53.00	296244	296231	296218	296205	296193	296180	296168	296155	296142	296129	296118	29610
10	6228	6215	6202	6189	6177	6164	6152	6139	6126	6113	6101	608
20	6212	6199	6186	6173	6160	6147	6135	6122	6109	6096	6084	6071
30	6197	6183	6170	6157	6144	6131	6119	6106	6093	6080	6068	605
40	6181	6167	6154	6141	6128	6115	6103	6090	6077	6064	6051	603
50	6165	6151	6138	6125	6112	6099	6086	6073	6060	6047	6035	602
54.00	296149	296135	296122	296109	296096	296083	296070	296057	296044	296031	296018	2960
10	6133	6119	6106	6093	6080	6067	6054	6041	6028	6015	6001	598
20	6117	6103	6090	6077	6064	6051	6037	6024	6011	5998	5985	597
30	6101	6087	6074	6061	6047	6034	6021	6008	5995	5982	5968	595
40	6086	6071	6058	6045	6031	6018	6005	5992	5979	5966	5952	59
50	6070	6055	6042	6029	6015	6002	5988	5975	5962	5949	5935	592
55.00	296053	296039	296026	206012	295999	295986	295972	295959	295946	295933	295919	2959
10	6037	6023	6010	5996	5983	5970	5956	5943	5930	5917	5903	58
20	6021	6007	5994	5980	5967	5954	5939	5926	5913	5900	5887	587
30	6005	5991	5978	5964	5950	5937	5923	5910	5897	5884	5871	585
40	5990	5975	5962	5948	5934	5921	5907	5894	5881	5868	5856	584
50	5974	5959	5946	5932	5918	5905	5890	5877	5864	5851	5839	582
56.00	295957	295943	295929	295916	295902	295888	295875	295861	295848	295834	995822	2958
10	5941	5927	5913	5900	5886	5872	5858	5845	5832	5819	5805	579
20	5925	5911	5897	5884	5870	5856	5842	5829	5816	5803	5789	577
30	5909	5895	5881	5868	5853	5839	5825	5812	5799	5786	5772	575
40	5894	5879	5865	5852	5837	5823	5809	5796	5783	5770	5756	574
50	5879	5863	5849	5836	5821	5807	5793	5780	5767	5754	5739	572
57.00	295861	295847	295833	295819	295805	295791	295777	295764	295750	295736	295723	2957
10	5845	5831	5817	5803	5789	5775	5762	5748	5734	5720	5706	56
20	5829	5815	5801	5787	5773	5759	5745	5731	5717	5703	5690	56
30	5814	5799	5785	5771	5756	5742	5729	5715	5701	5687	5673	56
40	5799	5783	5769	5756	5740	5726	5713	5699	5685	5671	5657	56
50	5782	5767	5753	5739	5724	5710	5696	5682	5668	5654	5640	56
58.00	295765	295751	295736	295722	295708	295694	295680	295666	295652	295638	295624	29561
10	5749	5735	5720	5706	5692	5680	5664	5650	5636	5622	5608	5594
20	5733	5719	5704	5690	5676	5664	5647	5633	5619	5605	5591	5577
30	5717	5702	5687	5673	5659	5647	5631	5617	5603	5589	5575	5561
40	5701	5686	5671	5657	5643	5631	5615	5601	5587	5573	5559	5545
50	5685	5670	5655	5641	5627	5615	5598	5584	5570	5556	5542	5528
59.00	295669	295654	295640	295625	295611	295597	295582	295568	295554	295540	295526	295512
10	5652	5638	5624	5609	5595	5581	5566	5552	5538	5524	5509	5495
20	5635	5622	5608	5593	5579	5565	5550	5536	5522	5508	5493	5479
30	5620	5606	5592	5577	5562	5548	5533	5519	5505	5491	5476	5462
40	5605	5590	5576	5561	5546	5532	5517	5503	5489	5475	5460	5446
50	5589	5574	5560	5545	5530	5316	5501	5487	5473	5459	5443	5429
60.00	295573	295558	295544	295529	295514	295500	295485	295471	295456	295442	295427	29541
10	5557	5542	5528	5513	5498	5484	5470	5455	5440	5425	5411	5397
20	5541	5526	5512	5497	5482	5468	5453	5438	5423	5408	5394	5380
30	5525	5510	5496	5481	5465	5451	5437	5422	5407	5392	5378	5364
40	5509	5494	5480	5465	5449	5435	5421	5406	5391	5376	5362	5348
50	5493	5478	5464	5449	5433	5419	5404	5389	5374	5359	5345	5331
61.00	295477	295462	295447	295432	295417	295402	295388	295373	295358	295344	295329	29531
10	5461	5446	5431	5416	5401	5386	5372	5357	5342	5327	5313	5298
20	5445	5430	5415	5400	5385	5370	5355	5340	5325	5310	5296	5281
30	5429	5414	5399	5384	5368	5353	5339	5324	5309	5294	5280	5265
40	5413	5398	5383	5368	5352	5337	5323	5308	5293	5278	5264	5249
50	5397	5382	5367	5352	5336	5321	5306	5291	5276	5261	5247	5232

TABLE XXXV.

LUNI-SOLAR TABLE,

For clearing the Angular Distance between the Sun, Moon, and Stars, from the effect of Refraction and Parallax.

	Moon's Apparent Altitude.						Moon's Apparent Altitude.					
	50°						51°					
h. p.	00′	10′	20′	30′	40′	50′	00	10′	20′	30′	40′	50′
′ ″												
53.00	296092	296079	296067	296055	296041	296029	296017	296005	295993	295981	295968	295956
10	6075	6062	6050	6038	6024	6012	6000	5988	5976	5964	5951	5939
20	6058	6045	6033	6021	6008	5996	5983	5971	5959	5947	5934	5922
30	6042	6029	6017	6005	5991	5979	5967	5955	5943	5931	5918	5906
40	6025	6012	6000	5988	5974	5962	5950	5938	5926	5914	5901	5889
50	6009	5996	5984	5972	5958	5946	5933	5921	5909	5897	5884	5872
54.00	295992	295979	295967	295954	295941	295029	295916	295904	295892	295879	295867	295855
10	5975	5962	5950	5938	5924	5912	5899	5887	5875	5863	5850	5838
20	5959	5946	5934	5922	5908	5896	5882	5870	5858	5846	5833	5821
30	5942	5929	5917	5905	5891	5879	5865	5853	5841	5829	5816	5804
40	5926	5913	5901	5889	5875	5863	5849	5837	5825	5813	5800	5788
50	5909	5896	5884	5872	5858	5846	5832	5820	5808	5796	5783	5771
55.00	295893	295880	295867	295854	295841	295829	295816	295803	295791	295778	295766	295753
10	5877	5863	5850	5837	5824	5812	5798	5786	5774	5762	5749	5736
20	5861	5847	5834	5821	5808	5796	5782	5770	5758	5746	5732	5719
30	5845	5830	5817	5804	5791	5779	5765	5753	5741	5729	5715	5702
40	5830	5814	5801	5788	5775	5763	5748	5736	5724	5712	5698	5685
50	5813	5797	5784	5771	5758	5746	5732	5720	5708	5696	5681	5668
56.00	295794	295781	295768	295755	295742	295729	295716	295703	295690	295677	295664	295652
10	5777	5764	5751	5738	5725	5712	5697	5686	5673	5660	5647	5635
20	5761	5748	5735	5722	5709	5696	5682	5669	5656	5643	5630	5618
30	5744	5731	5718	5705	5692	5679	5665	5652	5639	5626	5613	5601
40	5728	5715	5702	5689	5675	5662	5649	5636	5623	5610	5597	5585
50	5711	5698	5685	5672	5658	5646	5632	5619	5606	5593	5580	5568
57.00	295695	295682	295669	295655	295642	295629	295616	295602	295589	295576	295563	295550
10	5678	5665	5652	5639	5625	5612	5598	5585	5572	5559	5546	5533
20	5662	5649	5636	5623	5609	5596	5582	5569	5556	5543	5529	5516
30	5645	5632	5619	5606	5592	5579	5565	5552	5539	5526	5512	5499
40	5629	5616	5603	5590	5575	5562	5548	5535	5522	5509	5496	5483
50	5612	5599	5586	5573	5558	5546	5532	5519	5506	5493	5479	5466
58.00	295597	295583	295569	295556	295541	295529	295515	295502	295489	295475	295462	295449
10	5580	5566	5552	5538	5525	5512	5498	5485	5472	5459	5445	5432
20	5563	5550	5536	5523	5509	5496	5481	5468	5455	5442	5428	5415
30	5547	5533	5519	5506	4492	5479	5464	5451	5438	5425	5411	5398
40	5531	5517	5503	5490	5475	5462	5448	5435	5422	5409	5395	5382
50	5514	5500	5486	5473	5459	5446	5431	5418	5405	5392	5378	5365
59.00	295498	295484	295470	295456	295442	295429	295415	295401	295388	295374	295361	295348
10	5481	5467	5453	5439	5425	5412	5397	5384	5371	5358	5344	5331
20	5465	5451	5437	5423	5409	5396	5381	5368	5355	5342	5327	5314
30	5448	5434	5420	5406	5392	5379	5364	5351	5338	5325	5311	5298
40	5432	5418	5404	5390	5375	5362	5347	5334	5321	5308	5294	5281
50	5415	5401	5387	5373	5359	5346	5331	5318	5305	5290	5277	5264
60.00	295399	295385	295371	295356	295342	295329	295315	295301	295287	295273	295260	295246
10	5383	5368	5354	5340	5325	5312	5298	5284	5270	5256	5243	5229
20	5366	5352	5338	5324	5309	5296	5281	5267	5253	5239	5226	5212
30	5350	5335	5321	5307	5292	5279	5264	5250	5236	5222	5209	5195
40	5334	5319	5305	5291	5275	5262	5248	5234	5220	5206	5193	5179
50	5317	5302	5288	5274	5259	5246	5231	5217	5203	5189	5176	5162
61.00	295300	295286	295272	295257	295242	295229	295214	295200	295186	295172	295159	295145
10	5283	5269	5255	5241	5225	5212	5197	5183	5169	5155	5142	5128
20	5266	5253	5239	5225	5209	5196	5180	5166	5152	5138	5125	5111
30	5250	5236	5222	5208	5192	5179	5163	5149	5135	5121	5108	5094
40	5234	5220	5206	5192	5175	5162	5147	5133	5119	5105	5092	5078
50	5217	5203	5189	5175	5159	5146	5130	5116	5102	5088	5075	5061

TABLE XXXV.

LUNI-SOLAR TABLE,

For clearing the Angular Distance between the Sun, Moon, and Stars, the effect of Refraction and Parallax.

	Moon's Apparent Altitude.						Moon's Apparent Altitude				
	52°						53°				
h. p.	00′	10′	20′	30′	40′	50′	00′	10′	20′	30′	40′
′ ″											
53.00	295944	295932	295920	295908	295896	295885	295873	295861	295849	295837	295826
10	5927	5915	5903	5891	5879	5867	5856	5844	5832	5820	5809
20	5910	5898	5886	5874	5862	5850	5839	5827	5815	5803	5791
30	5894	5881	5869	5857	5845	5833	5822	5810	5798	5786	5774
40	5877	5864	5852	5840	5828	5816	5804	5792	5780	5768	5757
50	5860	5847	5835	5823	5811	5799	5787	5775	5763	5751	5739
54.00	295849	295830	295818	295806	295794	295782	295770	295758	295746	295734	295722
10	5826	5813	5801	5789	5777	5765	5753	5741	5729	5717	5705
20	5809	5796	5784	5772	5760	5748	5736	5724	5712	5700	5687
30	5792	5779	5767	5755	5742	5730	5718	5706	5694	5682	5670
40	5776	5762	5750	5738	5725	5713	5701	5689	5677	5665	5653
50	5759	5745	5733	5721	5708	5696	5684	5672	5650	5649	5635
55.00	295741	295728	295716	295703	295691	295679	295667	295655	295639	295630	295618
10	5723	5711	5699	5687	5674	5662	5650	5638	5622	5612	5601
20	5706	5694	5682	5670	5667	5645	5633	5620	5605	5594	5584
30	5689	5677	5665	5653	5640	5628	5616	5603	5587	5577	5566
40	5672	5660	5648	5636	5623	5611	5599	5586	5570	5560	5549
50	5655	5643	5231	5619	5606	5594	5581	5568	5553	5542	5532
56.00	295639	295626	295614	295601	295589	295576	295564	295551	295539	295527	295515
10	5623	5609	5597	5585	5572	5559	5546	5534	5522	5510	5498
20	5606	5592	5580	5568	5555	5543	5529	5517	5505	5493	5480
30	5589	5575	5563	5551	5538	5526	5511	5499	5487	5475	5463
40	5573	5559	5547	5535	5521	5509	5494	5482	5470	5458	5446
50	5556	5542	5530	5518	5504	5492	5477	5465	5453	5441	5428
57.00	295537	295525	295512	295499	295486	295473	295461	295448	295436	295423	295411
10	5220	5508	5495	5482	5469	5456	5443	5431	5419	5407	5394
20	5503	5491	5478	5465	5452	5439	5426	5414	5402	5390	5376
30	5486	5474	5461	5448	5435	5422	5408	5396	5384	5372	5359
40	5470	5457	5444	5431	4418	5405	5391	5379	5367	5355	5342
50	5453	5440	5427	5414	5401	5388	5374	5362	5350	5348	5324
58.00	295436	295423	295410	295397	295384	295371	295358	295345	295332	295320	295307
10	5419	5406	5393	5380	5367	5354	5341	5328	5315	5302	5290
20	5402	5389	5376	5363	5350	5337	5324	5311	5298	5286	5272
30	5385	5372	5359	5346	5333	5320	5306	5293	5280	5268	5255
40	5369	5355	5342	5329	5316	5303	5289	5276	5263	5251	5238
50	5352	5338	5325	5312	5299	5286	5272	5259	5246	5234	5220
59.00	295334	295321	295308	295294	295281	295268	295255	295242	295229	295216	295203
10	5318	5304	5291	5278	5264	5251	5238	5225	5212	5199	5186
20	5301	5287	5274	5261	5247	5234	5221	5208	5195	5182	5168
30	5285	5270	5257	5244	5230	5217	5203	5190	5177	5164	5151
40	5268	5253	5240	5227	5213	5200	5186	5173	5160	5147	5134
50	5251	5236	5223	5210	5196	5183	5169	5156	5143	5130	5116
60.00	295233	295219	295206	295192	295179	295165	295152	295139	295126	295113	295099
10	5215	5202	5189	5176	5161	5147	5135	5122	5109	5096	5082
20	5198	5185	5172	5159	5145	5131	5118	5105	5092	5079	5065
30	5181	5168	5155	5142	5128	5114	5100	5087	5074	5061	5047
40	5165	5151	5138	5125	5111	5097	5083	5070	5057	5044	5030
50	5148	5134	5121	5108	5094	5080	5066	5053	5040	5027	5013
61.00	295131	295117	295104	295090	295076	295063	295049	295036	295022	295009	294996
10	5114	5100	5087	5074	5059	5046	5033	5019	5005	4991	4979
20	5097	5083	5070	5057	5042	5029	5016	5002	4988	4974	4962
30	5080	5066	5053	5040	5025	5012	4998	4984	4970	4956	4944
40	5064	5040	5036	5023	5008	4995	4981	4967	4953	4939	4927
50	5047	5032	5019	5006	4992	4978	4964	4950	4936	4922	4910

TABLE XXXV.

LUNI-SOLAR TABLE,

ng the Angular Distance between the Sun, Moon, and Stars, from the effect of Refraction and Parallax.

oon's Apparent Altitude.					Moon's Apparent Altitude.					
54°					55°					
10′	20′	30′	40′	50′	00′	10′	20′	30′	40′	50′
295793	295781	295769	295758	295747	295735	295724	295713	295602	295691	295679
5775	5763	5751	5740	5729	5717	5706	5795	5584	5673	5661
5757	5745	5733	5722	5711	5699	5688	5677	5566	5656	5644
5740	5728	5716	5705	5694	5682	5671	5660	5549	5638	5626
5722	5710	5698	5687	5676	5664	5653	5642	5531	5620	5608
5705	5693	5681	5660	5659	5647	5636	5625	5514	5603	5591
295687	295675	295664	295652	295641	295630	295618	295607	295591	295585	295573
5669	5657	5645	5634	5623	5612	5600	5589	5578	5567	5555
5652	5640	5628	5617	5606	5595	5583	5572	5551	5550	5538
5634	5622	5610	5599	5588	5577	5565	5554	5543	5532	5520
5617	5605	5593	5582	5571	5560	5548	5537	5526	5515	5503
5599	5587	5575	5564	5553	5542	5530	5519	5508	5497	5485
295582	295571	295559	295547	295536	295524	295513	295501	295490	295478	295467
5565	5554	5543	5529	5518	5506	5495	5483	5472	5450	5449
5547	5536	5525	5512	5501	5489	5478	5466	5455	5443	5432
5530	5519	5518	5494	5483	5471	5460	5449	5438	5425	5414
5513	5502	5491	5477	5466	5453	5442	5431	5420	5407	5395
5495	5484	5473	5459	5448	5436	5425	5413	5402	5390	5378
95478	295466	295454	295442	295430	295419	295407	295395	295383	295372	295360
5461	5449	5437	5424	5412	5401	5389	5377	5365	5354	5342
5443	5431	5419	5407	5395	5384	5372	5366	5348	5336	5324
5426	5414	5402	5389	5377	5366	5354	5342	5330	5318	5306
5409	5397	5385	5372	5360	5348	5336	5325	5313	5301	5289
5391	5379	5367	5354	5342	5331	5319	5307	5295	5284	5272
95374	295362	295349	295337	295327	295313	295301	295289	295277	295265	295254
5356	5344	5332	5319	5305	5295	5283	5271	5259	5247	5236
5339	5327	5315	5302	5290	5278	5266	5254	5242	5230	5219
5321	5309	5297	5284	5272	5260	5248	5237	5225	5212	5201
5304	5292	5280	5267	5255	5242	5230	5218	5206	5194	5182
5386	5274	5262	5249	5237	5225	5213	5201	5189	5177	5165
95269	295257	295243	295232	295220	295208	295195	295183	295171	295159	295147
5252	5240	5228	5214	5202	5190	5177	5165	5153	5141	5129
5234	5222	5210	5197	5185	5173	5160	5148	5136	5124	5112
5217	5205	5193	5178	5167	5155	5142	5130	5118	5106	5094
5200	5188	5176	5162	5150	5137	5125	5113	5101	5088	5076
5182	5170	5158	5144	5132	5119	5107	5095	5083	5071	5059
95165	295152	295140	295127	295114	295102	295090	295077	295065	295054	295041
5147	5134	5121	5109	5096	5084	5072	5059	5047	5035	5023
5130	5117	5104	5092	5079	5067	5055	5042	5030	5017	5005
5112	5099	5086	5074	5061	5049	5037	5014	5002	4999	4987
5095	5082	5069	5057	5044	5031	5019	4996	4984	4982	4970
5077	5064	5051	5039	5026	5014	5002	4989	4977	4965	4953
95060	295048	295035	295022	295009	294997	294984	294971	294959	294946	294934
5043	5031	5019	5004	4991	4979	4966	4953	4941	4928	4916
5025	5013	5001	4987	4974	4962	4949	4936	4924	4911	4899
5008	4996	4984	4969	4956	4944	4931	4918	4906	4893	4881
4991	4979	4967	4952	4939	4926	4913	4900	4888	4875	4863
4173	4961	4949	4934	4921	4909	4896	4883	4871	4858	4846
94956	294943	294930	294917	294904	294891	294878	294865	294853	294840	294827
4939	4926	4913	4899	4886	4873	4860	4847	4835	4822	4809
4921	4908	4895	4882	4869	4856	4843	4830	4818	4805	4793
4904	4891	4878	4864	4851	4838	4825	4812	4800	4787	4775
4887	4874	4861	4847	4834	4820	4807	4794	4782	4769	4757
4869	4856	4843	4829	4816	4803	4790	4777	4765	4752	4740

TABLE XXXV.

LUNI-SOLAR TABLE,

For clearing the Angular Distance between the Sun, Moon, and Stars, from the effect of Refraction and Parallax.

	Moon's Apparent Altitude.						Moon's Apparent Altitude.					
	56°						57°					
h. p.	00′	10′	20′	30′	40′	50′	00′	10′	20′	30′	40′	50′
′ ″												
53.00	295668	295657	295646	295635	295624	295613	295615	295604	295593	295574	295563	[illegible]
10	5650	5639	5628	5617	5606	5595	5597	5586	5575	5556	5545	[illegible]
20	5633	5622	5611	5600	5589	5578	5579	5568	5557	5538	5527	[illegible]
30	5615	5605	5594	5583	5572	5561	5551	5540	5529	5520	5509	[illegible]
40	5597	5587	5576	5565	5554	5543	5533	5522	5511	5501	5490	[illegible]
50	5580	5569	5558	5547	5536	5525	5515	5504	5493	5483	5472	[illegible]
54.00	295562	295551	295540	295529	295518	295507	295497	295486	295475	295464	295454	[illegible]
10	5544	5533	5522	5511	5500	5489	5479	5468	5464	5447	5436	[illegible]
20	5527	5515	5504	5493	5482	5471	5461	5450	5439	5429	5418	[illegible]
30	5509	5497	5486	5475	5464	5453	5442	5432	5421	5410	5399	[illegible]
40	5492	5480	5469	5458	5447	5436	5425	5414	5403	5392	5381	[illegible]
50	5474	5463	5452	5441	5430	5419	5407	5396	5385	5374	5363	[illegible]
55.00	295456	295444	295433	295422	295411	295400	295389	295378	295367	295356	295345	[illegible]
10	5438	5426	5415	5404	5393	5382	5376	5360	5359	5338	5327	[illegible]
20	5421	5408	5397	5386	5375	5363	5353	5342	5331	5320	5309	[illegible]
30	5403	5390	5379	5368	5357	5346	5335	5324	5313	5301	5290	[illegible]
40	5384	5373	5362	5351	5340	5329	5317	5306	5295	5283	5272	[illegible]
50	5367	5356	5344	5333	5322	5312	5299	5288	5277	5265	5254	[illegible]
56.00	295349	295337	295325	295314	295303	295292	295281	295269	295258	295247	295236	[illegible]
10	5330	5319	5208	5297	5285	5274	5263	5251	5240	5229	5218	[illegible]
20	5312	5301	5290	5279	5267	5256	5245	5233	5222	5211	5200	[illegible]
30	5294	5283	5272	5261	5249	5238	5226	5215	5204	5192	5181	[illegible]
40	5277	5266	5255	5244	5232	5221	5208	5197	5186	5174	5163	[illegible]
50	5260	5249	4238	5225	5215	5202	5190	5179	5168	5156	5145	[illegible]
57.00	295242	295230	295219	295207	295196	295184	295173	295161	295150	295138	295127	[illegible]
10	5224	5212	5201	5189	5178	5166	5155	5143	5132	5121	5109	[illegible]
20	5207	5194	5183	5171	5160	5148	5137	5125	5114	5102	5091	[illegible]
30	5189	5176	5165	5153	5142	5130	5119	5107	5096	5084	5072	[illegible]
40	5170	5159	5148	5136	5125	5113	5101	5089	5078	5066	5054	[illegible]
50	5153	5142	5131	5119	5108	5096	5083	5061	5059	5048	5036	[illegible]
58.00	295135	295123	295111	295100	295088	295076	295065	295053	295041	295030	295018	[illegible]
10	5117	5105	5093	5082	5070	5058	5047	5035	5023	5012	5000	[illegible]
20	5100	5087	5075	5064	5052	5040	5029	5017	5005	5094	4982	[illegible]
30	5082	5069	5057	5046	5034	5022	5011	4999	4987	5075	4963	[illegible]
40	5064	5052	5040	5029	5017	5005	4993	4982	4970	5057	4945	[illegible]
50	5047	5035	5023	5012	5000	4988	4975	4964	4952	5039	4927	[illegible]
59.00	295028	295016	295004	294992	294980	294968	294956	294945	294933	294921	294909	[illegible]
10	5010	4998	4986	4974	4962	4950	4948	4938	4925	4902	4891	[illegible]
20	4992	4980	4968	4956	4944	4932	4920	4910	4897	4885	4873	[illegible]
30	4975	4962	4950	4938	4926	4914	4903	4892	4880	4867	4855	[illegible]
40	4959	4945	4933	4921	4909	4897	4885	4874	4862	4849	4837	[illegible]
50	4941	4928	4915	4903	4892	4880	4866	4855	4843	4831	4819	[illegible]
60.00	294922	294909	294897	294885	294873	294861	294848	294836	294824	294813	294801	[illegible]
10	4904	4891	4879	4867	4855	4843	4830	4818	4806	4795	4783	[illegible]
20	4887	4873	4861	4849	4837	4825	4812	4800	4788	4777	4765	[illegible]
30	4869	4855	4843	4831	4819	4807	4794	4782	4770	4758	4746	[illegible]
40	4851	4838	4826	4813	4802	4790	4776	4764	4752	4740	4728	[illegible]
50	4834	4821	4809	4796	4785	4773	4758	4746	4734	4722	4710	[illegible]
61.00	294815	294802	294790	294777	294765	294753	294740	294728	294716	294704	294692	[illegible]
10	4797	4784	4772	4759	4747	4735	4722	4710	4698	4686	4674	[illegible]
20	4781	4766	4754	4741	4729	4717	4704	4692	4680	4668	4656	[illegible]
30	4763	4748	4736	4723	4711	4699	4686	4674	4662	4649	4637	[illegible]
40	4745	4731	4719	4706	4694	4682	4668	4656	4644	4631	4619	[illegible]
50	4728	4714	4702	4689	4677	4665	4650	4638	4626	4613	4601	[illegible]

LUNI-SOLAR TABLE,

For clearing the Angular Distance between the Sun, Moon, and Stars, from the effect of Refraction and Parallax.

	Moon's Apparent Altitude.						Moon's Apparent Altitude.					
	58°						59°					
h. p.	00′	10′	20′	30′	40′	50′	00′	10′	20′	30′	40′	50′
′ ″												
53.00	295541	295531	295521	295511	295500	295490	295480	295470	295460	295450	295440	295431
10	5523	5513	5503	5493	5482	5472	5462	5452	5442	5432	5423	5413
20	5505	5495	5485	5475	5464	5454	5443	5433	5423	5413	5404	5394
30	5487	5477	5467	5457	5446	5436	5425	5415	5405	5395	5386	5376
40	5468	5458	5458	5438	5427	5417	5417	5497	5387	5377	5367	5357
50	5450	5440	5430	5420	5409	5398	5388	5378	5368	5358	5349	5339
54.00	295433	295422	295412	295401	295391	295381	295370	295360	295350	295340	295330	295320
10	5414	5404	5394	5383	5372	5362	5352	5342	5332	5322	5312	5302
20	5396	5386	5376	5365	5354	5344	5333	5323	5313	5303	5293	5283
30	5377	5367	5357	5347	5336	5326	5315	5305	5295	5285	5274	5264
40	5359	5349	5338	5328	5317	5307	5297	5287	5277	5267	5256	5246
50	5341	5331	5320	5310	5299	5289	5279	5268	5258	5258	5237	5227
55.00	295324	295313	295302	295291	295281	295270	295260	295250	295240	295229	295219	295209
10	5305	5295	5284	5272	5262	5251	5242	5232	5222	5211	5200	5190
20	5287	5277	5266	5254	5244	5233	5223	5213	5203	5193	5182	5172
30	5268	5258	5247	5235	5225	5234	5205	5195	5185	5174	5163	5153
40	5250	5240	5229	5217	5207	5206	5187	5177	5167	5156	5145	5135
50	5232	5222	5211	5199	5189	5179	5168	5158	5148	5137	5126	5116
56.00	295214	295203	295192	295182	295171	295160	295150	295139	295128	295118	295108	295097
10	5196	5185	5174	5164	5153	5142	5132	5121	5110	5099	5089	5079
20	5178	5167	5156	5145	5134	5123	5113	5102	5092	5081	5071	5060
30	5159	5148	5137	5126	5115	5104	5095	5084	5073	5062	5052	5042
40	5141	5130	5119	5108	5097	5086	5077	5066	5056	5044	5034	5024
50	5123	5112	5101	5089	5078	5067	5058	5047	5037	5025	5015	5005
57.00	295105	295094	295083	295072	295061	295050	295039	295028	295018	295007	294996	294986
10	5087	5076	5065	5053	5042	5031	5021	5010	5000	4988	4977	4967
20	5069	5058	5047	5035	5024	5013	5002	4991	4981	4970	4959	4949
30	5050	5039	5028	5016	5005	4994	4984	4973	4963	4951	4940	4930
40	5032	5021	5010	4998	4987	4976	4966	4955	4945	4933	4922	4912
50	5014	5003	4992	4979	4969	4958	4947	4936	4926	4914	4903	4893
58.00	294996	294984	294973	294962	294951	294940	294929	294918	294907	294896	294885	294875
10	4977	4965	4954	4943	4932	4921	4911	4900	4889	4877	4866	4856
20	4960	4948	4937	4925	4914	4903	4892	4881	4870	4859	4847	4838
30	4941	4929	4919	4906	4895	4884	4874	4863	4852	4840	4828	4819
40	4922	4910	4899	4888	4877	4866	4856	4845	4833	4822	4811	4800
50	4904	4891	4880	4870	4859	4848	4837	4826	4815	4803	4792	4781
59.00	294886	294875	294863	294852	294841	294836	294818	294807	294796	294785	294774	294763
10	4868	4856	4844	4832	4822	4811	4800	4789	4778	4766	4755	4744
20	4850	4837	4826	4814	4804	4793	4781	4770	4759	4748	4737	4726
30	4832	4819	4808	4796	4785	4774	4763	4752	4741	4730	4719	4708
40	4815	4802	4791	4779	4767	4756	4745	4734	4723	4712	4701	4690
50	4796	4785	4774	4762	4749	4738	4726	4715	4704	4693	4682	4671
60.00	294777	294766	294754	294743	294732	294719	294708	294797	294685	294674	294663	294652
10	4758	4747	4735	4724	4713	4701	4690	4679	4668	4655	4644	4632
20	4740	4729	4717	4706	4695	4683	4671	4660	4649	4637	4626	4614
30	4722	4711	4708	4687	4676	4664	4654	4642	4631	4618	4607	4595
40	4703	4692	4681	4669	4658	4646	4636	4624	4613	4600	4589	4577
50	4685	4674	4662	4650	4639	4627	4617	4605	4594	4581	4570	4558
61.00	294668	294656	294644	294633	294621	294609	294598	294586	294575	294563	294552	294541
10	4649	4637	4626	4614	4602	4590	4580	4568	4557	4544	4533	4522
20	4631	4619	4607	4596	4584	4572	4560	4549	4538	4526	4515	4504
30	4613	4601	4589	4577	4565	4554	4542	4531	4520	4507	4496	4485
40	4594	4582	4570	4558	4546	4535	4524	4513	4502	4489	4478	4467
50	4576	4564	4552	4540	4528	4516	4506	4494	4483	4470	4459	4448

TABLE XXXV.

LUNI-SOLAR TABLE,

For clearing the Angular Distance between the Sun, Moon, and Stars, from the effect of Refraction and Parallax.

	Moon's Apparent Altitude.						Moon's Apparent Altitude.					
	60°						61°					
h. p.	00'	10'	20'	30'	40'	50'	00'	10'	20'	30'	40'	50'
' "												
53.00	295421	295411	295402	295393	295383	295373	295365	295355	295345	296336	295326	[illegible]
10	5404	5393	5383	5374	5364	5354	5346	5336	5326	5316	5307	[illegible]
20	5385	5375	5365	5356	5346	5336	5327	5317	5307	5297	5288	[illegible]
30	5366	5356	5346	5337	5327	5317	5309	5299	5289	5279	5270	[illegible]
40	5347	5337	5327	5318	5308	5298	5290	5280	5270	5260	5251	[illegible]
50	5329	5319	5309	5299	5290	5280	6271	5261	5251	5241	5232	[illegible]
54.00	295310	295300	295290	295280	295271	295261	295251	295242	295232	295222	295213	[illegible]
10	5292	5281	5271	5261	5252	5242	5233	5223	5213	5203	5194	[illegible]
20	5273	5263	5253	5243	5234	5224	5215	5205	5195	5185	5175	[illegible]
30	5254	5244	5234	6224	5215	5205	5196	5186	5176	5166	5156	[illegible]
40	5236	5225	5215	5205	5196	5186	5177	5167	5157	5147	5138	[illegible]
50	5217	5207	5197	5187	5178	5168	5158	5148	5138	5128	5119	[illegible]
55.00	295198	295188	295178	295168	295158	295148	295139	295129	295119	295109	295100	[illegible]
10	5180	5169	5159	5149	5139	5129	5120	5110	5100	5090	5081	[illegible]
20	5163	5151	5141	5131	5121	5111	5101	5091	5081	5071	5062	[illegible]
30	5142	5132	5122	5112	5102	5092	5082	5072	5062	5052	5043	[illegible]
40	5124	5114	5103	5093	5083	5073	5064	5054	5044	5034	5025	[illegible]
50	5105	5095	5085	5075	5065	5055	5045	5035	5025	5015	5006	[illegible]
56.00	295087	295077	295066	295056	295046	295036	295026	295016	295006	294996	294987	[illegible]
10	5069	5058	5047	5037	5027	5017	4007	4997	4987	4977	4968	[illegible]
20	5050	5040	5029	5019	5009	5999	4988	4978	4968	4958	4949	[illegible]
30	5032	5021	5010	5000	5990	5980	4969	4959	4949	4939	4930	[illegible]
40	5013	5003	4991	5981	5971	5963	4951	4941	4931	4921	4912	[illegible]
50	4994	4984	4973	5963	5953	5941	4932	4922	4912	4902	4893	[illegible]
57.00	294975	294965	294954	294944	294934	294924	294913	294903	294893	294883	294873	[illegible]
10	4957	4946	4935	4925	4915	4905	4895	4885	4875	4865	4854	[illegible]
20	4939	4928	4917	4907	4897	4887	4876	4866	4856	4846	4835	[illegible]
30	4920	4909	4899	4888	4878	4868	4857	4847	4837	4827	4816	[illegible]
40	4901	4891	4881	4870	4859	4849	4838	4828	4818	4808	4798	[illegible]
50	4883	4872	4862	4851	4841	4830	4819	4809	4799	4789	4779	[illegible]
58.00	294864	294853	294843	294832	294822	294811	294801	294791	294781	294770	294760	[illegible]
10	4843	4834	4824	4813	4803	4792	4782	4772	4762	4752	4741	[illegible]
20	4827	4816	4806	4795	4785	4774	4764	4754	4744	4734	4722	[illegible]
30	4808	4797	4787	4776	4766	4755	4745	4735	4725	4715	4704	[illegible]
40	4789	4778	4768	4757	4747	4736	4726	4716	4706	4695	4685	[illegible]
50	4771	4760	4750	4739	4729	4718	4707	4697	4687	4676	4666	[illegible]
59.00	294752	294741	294731	294720	294709	294699	294688	294678	294667	294657	294647	[illegible]
10	4733	4722	4712	4701	4690	4680	4669	4659	4648	4638	4628	[illegible]
20	4715	4704	4694	4683	4672	4662	4650	4640	4629	4619	4609	[illegible]
30	4696	4685	4675	4661	4653	4643	4631	4621	4610	4600	4590	[illegible]
40	4678	4667	4657	4645	4634	4624	4613	4603	4592	4582	4572	[illegible]
50	4659	4648	4638	4627	4616	4606	4594	4584	4573	4563	4553	[illegible]
60.00	294641	294630	294619	294608	294597	294586	294576	294565	294554	294544	294533	[illegible]
10	4622	4611	4600	4589	4578	4568	4556	4546	4535	4525	4514	[illegible]
20	4604	4593	4582	4571	4560	4550	4537	4527	4517	4506	4495	[illegible]
30	4585	4574	4563	4552	4541	4531	4518	4508	4497	4487	4476	[illegible]
40	4566	4555	4544	4533	4522	4511	4500	4490	4479	4469	4458	[illegible]
50	4448	4537	4526	4515	4504	4493	4481	4471	4460	4450	4439	[illegible]
61.00	294530	294518	294507	294496	294485	294474	294463	294452	294441	294431	294420	[illegible]
10	4511	4499	4488	4477	4466	4455	4443	4433	4422	4412	4401	[illegible]
20	4493	4481	4470	4459	4448	4437	4424	4414	4403	4393	4382	[illegible]
30	4474	4462	4451	4440	4429	4418	4405	4395	4384	4374	4363	[illegible]
40	4455	4443	4432	4421	4410	4400	4387	4377	4366	4356	4345	[illegible]
50	4437	4425	4414	4403	4391	4381	4368	4358	4347	4337	4326	[illegible]

TABLE XXXV.

LUNI-SOLAR TABLE,

For clearing the Angular Distance between the Sun, Moon, and Stars, from the effect of Refraction and Parallax.

	Moon's Apparent Altitude.						Moon's Apparent Altitude.					
	62°						63°					
h. p.	00′	10′	20′	30′	40′	50′	00′	10′	20′	30′	40′	50′
′ ″												
53.00	295306	295298	295289	295279	295270	295261	295253	295244	295235	295228	295219	295210
10	5287	5279	5270	5260	5251	5242	5234	5225	5216	5209	5200	5191
20	5268	5260	5251	5241	5232	5223	5215	5206	5197	5190	5181	5172
30	5250	5242	5233	5223	5214	5205	5196	5187	5178	5170	5162	5153
40	5231	5223	5214	5204	5195	5186	5177	5168	5159	5151	5142	5133
50	5212	5204	5195	5285	5176	5167	5158	5149	5140	5132	5123	5114
54.00	295194	295185	295176	295166	295157	295148	295139	295130	295121	295113	295104	295095
10	5175	5166	5157	5147	5138	5129	5120	5111	5102	5094	5085	5076
20	5156	5147	5138	5128	5119	5110	5101	5092	5083	5075	5066	5057
30	5137	5128	5119	5109	5100	5091	5082	5073	5064	5056	5046	5037
40	5118	5109	5101	5090	5082	5072	5063	5054	5045	5037	5027	5018
50	5100	5090	5082	5071	5063	5053	5044	5035	5026	5018	5008	4999
55.00	295081	295071	295062	295052	295043	295034	295025	295016	295007	294998	294989	294980
10	5062	5052	5043	5033	5024	5015	5006	4997	4988	4979	4970	4961
20	5043	5033	5024	5014	5005	4996	4987	4978	4969	4960	4950	4941
30	5024	5014	5005	4995	4986	4977	4967	4958	4949	4940	4931	4922
40	5006	4996	4987	4977	4968	4958	4948	4939	4930	4921	4912	4903
50	4987	4977	4968	4958	4949	4939	4929	4920	4911	4902	4892	4883
56.00	294967	294958	294948	294938	294929	294919	294910	294901	294892	294882	294873	294864
10	4948	4939	4929	4919	4910	4900	4891	4882	4873	4863	4854	4845
20	4929	4920	4910	4900	4891	4881	4872	4863	4854	4844	4835	4826
30	4910	4901	4891	4881	4872	4862	4852	4843	4834	4824	4815	4806
40	4892	4883	4873	4863	4854	4844	4833	4824	4815	4805	4796	4787
50	4873	4864	4854	4844	4835	4825	4814	4805	4796	4786	4777	4768
57.00	294854	294844	294834	294824	294815	294805	294795	294786	294776	294767	294758	294749
10	4835	4825	4815	4805	4796	4786	4776	4767	4757	4748	4739	4730
20	4816	4806	4796	4786	4777	4767	4757	4748	4738	4729	4719	4710
30	4797	4787	4777	4767	4757	4748	4737	4728	4718	4709	4700	4691
40	4778	4768	4759	4749	4738	4730	4718	4709	4699	4690	4681	4672
50	4759	4749	4730	4730	4719	4710	4699	4690	4680	4671	4661	4652
58.00	294740	294730	294720	294710	294700	294690	294681	294671	294661	294652	294642	294633
10	4721	4711	4701	4690	4681	4671	4662	4652	4642	4633	4623	4614
20	4702	4692	4682	4672	4662	4652	4643	4633	4623	4614	4604	4595
30	4683	4673	4663	4653	4643	4633	4623	4613	4603	4594	4584	4575
40	4665	4655	4645	4635	4625	4615	4604	4594	4584	4575	4565	4556
50	4646	4636	4626	4615	4606	4596	4585	4575	4565	4556	4546	4537
59.00	294626	294616	294606	294596	294586	294576	294566	294556	294546	294537	294527	294518
10	4607	4597	4587	4577	4567	4557	4547	4537	4527	4518	4508	4499
20	4588	4578	4568	4558	4548	4538	4528	4518	4508	4499	4489	4480
30	4569	4559	4549	4539	4529	4519	4508	4498	4488	4479	4469	4460
40	4551	4541	4531	4521	4511	4501	4189	4479	4469	4460	4450	4441
50	4532	4522	4512	4502	4492	4481	4470	4460	4450	4441	4431	4422
60 00	294513	294502	294492	294482	294472	294461	294451	204441	294431	294422	294412	294402
10	4493	4483	4473	4463	4453	4442	4432	4422	4412	4403	4393	4383
20	4474	4464	4454	4444	4434	4423	4413	4403	4393	4384	4374	4364
30	4456	4445	4435	4425	4415	4404	4394	4384	4374	4365	4354	4344
40	4438	4427	4417	4407	4397	4385	4375	4365	4355	4346	4335	4325
50	4419	4408	4398	4388	4378	4366	4356	4346	4336	4327	4316	4306
61.00	294399	294388	294378	294368	294357	294347	294337	294327	294317	294307	294297	294287
10	4381	4369	4359	4348	4338	4328	4318	4308	4298	4288	4278	4268
20	4362	4350	4340	4329	4319	4309	4299	4289	4279	4269	4259	4249
30	4343	4332	4321	4310	4300	4290	4280	4270	4260	4250	4239	4229
40	4324	4313	4303	4292	4282	4272	4261	4251	4241	4231	4220	4210
50	4305	4294	4284	4273	4263	4253	4242	4232	4222	4212	4201	4191

TABLE XXXV.

LUNI-SOLAR TABLE,

For clearing the Angular Distance between the Sun, Moon, and Stars, from the effect of Refraction and Parallax.

	Moon's Apparent Altitude.						Moon's Apparent Altitude.					
	64°						65°					
h. p. ′ ″	00′	10′	20′	30′	40′	50′	00′	10′	20′	30′	40′	50′
53.00	295203	295194	295185	295177	295168	295159	295154	295145	295136	295128	295120	[illegible]
10	5184	5175	5166	5158	5149	5140	5134	5125	5116	5108	5100	[illegible]
20	5165	5155	5146	5138	5129	5120	5114	5105	5096	5088	5080	[illegible]
30	5146	5136	5127	5119	5110	5101	5094	5086	5077	5069	5061	[illegible]
40	5126	5117	5108	5100	5091	5082	5075	5066	5057	5049	5041	[illegible]
50	5107	5097	5088	5080	5071	5062	5056	5047	5038	5030	5022	[illegible]
54.00	295086	295078	295069	295060	295052	295043	295035	295027	295018	295010	295002	[illegible]
10	5067	5059	5050	5041	5033	5024	5015	5007	4998	4990	4982	[illegible]
20	5048	5039	5030	5021	5013	5004	4996	4988	4979	4971	4963	[illegible]
30	5028	5020	5011	5002	4994	4985	4976	4968	4959	4951	4943	[illegible]
40	5009	5001	4992	4983	4975	4966	4957	4949	4940	4932	4924	[illegible]
50	4990	4981	4972	4963	4955	4946	4937	4929	4920	4912	4904	[illegible]
55.00	294971	294962	294953	294944	294936	294927	294918	294910	294901	294893	294885	[illegible]
10	4952	4943	4934	4925	4916	4907	4898	4890	4881	4873	4865	[illegible]
20	4932	4923	4914	4905	4897	4888	4879	4871	4862	4854	4846	[illegible]
30	4913	4904	4895	4886	4877	4868	4859	4851	4842	4834	4826	[illegible]
40	4894	4885	4876	4867	4858	4849	4840	4832	4823	4815	4806	[illegible]
50	4874	4865	4856	4847	4838	4829	4820	4812	4803	4795	4787	[illegible]
56.00	294855	294846	294837	294828	294819	294811	294801	294793	294783	294776	294767	[illegible]
10	4836	4827	4818	4808	4800	4792	4782	4773	4763	4756	4747	[illegible]
20	4817	4807	4798	4789	4780	4772	4763	4754	4744	4737	4728	[illegible]
30	4797	4788	4779	4770	4761	4753	4743	4734	4724	4717	4708	[illegible]
40	4778	4769	4760	4751	4742	4734	4724	4715	4705	4698	4689	[illegible]
50	4759	4749	4740	4731	4722	4714	4704	4696	4687	4678	4669	[illegible]
57.00	294739	294730	294721	294712	294703	294694	294684	294676	294668	294659	294650	[illegible]
10	4720	4711	4702	4693	4684	4675	4664	4656	4648	4639	4630	[illegible]
20	4700	4691	4682	4673	4661	4655	4645	4637	4629	4620	4611	[illegible]
30	4681	4672	4663	4654	4645	4636	4625	4617	4609	4600	4591	[illegible]
40	4662	4653	4644	4635	4626	4617	4606	4598	4590	4581	4572	[illegible]
50	4643	4633	4624	4615	4606	4597	4587	4578	4570	4561	4552	[illegible]
58.00	294624	294614	294605	294596	294587	294578	294568	294560	294551	294542	294533	[illegible]
10	4605	4595	4586	4577	4567	4558	4549	4540	4531	4522	4513	[illegible]
20	4586	4575	4566	4557	4548	4539	4530	4521	4512	4503	4494	[illegible]
30	4566	4556	4547	4538	4528	4519	4510	4501	4492	4483	4474	[illegible]
40	4547	4537	4528	4519	4509	4500	4491	4482	4473	4464	4454	[illegible]
50	4528	4517	4508	4499	4489	4480	4471	4462	4453	4444	4435	[illegible]
59.00	294508	294498	294489	294480	294470	294461	294452	294443	294434	294425	294416	[illegible]
10	4489	4479	1470	4461	4451	4442	4432	4423	4414	4405	4396	[illegible]
20	4460	4460	4451	4442	4431	4422	4413	4404	4395	4386	4377	[illegible]
30	4440	4440	4431	4422	4412	4403	4393	4384	4375	4366	4359	[illegible]
40	4421	4421	4412	4403	4393	4384	4374	4365	4356	4347	4338	[illegible]
50	4402	4402	4393	4384	4373	4364	4354	4345	4336	4328	4318	[illegible]
60.00	294392	294383	294373	294364	294354	294345	294335	294326	294317	294308	294299	[illegible]
10	4373	4364	4354	4345	4335	4326	4315	4306	4297	4288	4279	[illegible]
20	4354	4344	4334	4325	4315	4306	4296	4287	4278	4269	4260	[illegible]
30	4334	4325	4315	4306	4296	4287	4276	4267	4258	4249	4240	[illegible]
40	4315	4306	4296	4287	4277	4268	4257	4248	4239	4230	4220	[illegible]
50	4296	4287	4276	4267	4257	4248	4238	4228	4219	4210	4201	[illegible]
61.00	294277	294267	294257	294247	294238	294228	294219	294209	294200	294191	294181	[illegible]
10	4258	4248	4238	4228	4219	4209	4199	4189	4180	4171	4162	[illegible]
20	4239	4228	4218	4208	4199	4189	4180	4170	4161	4152	4142	[illegible]
30	4219	4209	4199	4189	4180	4170	4160	4150	4141	4132	4122	[illegible]
40	4200	4190	4180	4170	4161	4151	4140	4130	4121	4112	4102	[illegible]
50	4181	4170	4160	4150	4141	4131	4121	4111	4102	4093	4083	[illegible]

TABLE XXXV.

LUNI-SOLAR TABLE,

For clearing the Angular Distance between the Sun, Moon, and Stars
the effect of Refraction and Parallax.

	Moon's Apparent Altitude.						Moon's Apparent Altitud				
	66°						67°				
h. p.	00′	10′	20′	30′	40′	50′	00′	10′	20′	30′	40
′ ″											
53.00	295104	295096	295088	295080	295072	295064	295055	295048	295041	295035	295
10	5084	5076	5068	4060	5052	5044	5035	5028	5021	5015	5
20	5064	5057	5049	5041	5033	5025	5016	5009	5002	4995	4
30	5045	5037	5029	5021	5013	5005	4996	4989	4982	4975	4
40	5025	5017	5009	5001	4993	4985	4976	4969	4962	4955	4
50	5006	4998	4990	4982	4974	4966	4957	4950	4943	4935	4
54.00	294986	294978	294970	294962	294954	294946	294938	294930	294923	294915	294
10	4966	4958	4950	4942	4934	4926	4918	4910	4903	4895	4
20	4947	4939	4931	4923	4915	4907	4899	4891	4884	4876	4
30	4927	4919	4911	4903	4895	4887	4879	4871	4864	4856	4
40	4908	4899	4891	4883	4875	4867	4859	4851	4844	4836	4
50	4888	4880	4872	4864	4856	4848	4840	4832	4824	4816	4
55.00	294868	294860	294852	294844	294836	294828	294820	294812	294804	294796	294
10	4848	4840	4832	4824	4816	4808	4800	4792	4784	4776	4
20	4829	4821	4813	4805	4796	4788	4780	4772	4764	4756	4
30	4809	4801	4793	4785	4776	4768	4760	4752	4744	4736	4
40	4789	4781	4773	4765	4757	4749	4741	4733	4725	4717	4
50	4770	4762	4754	4746	4737	4729	4721	4713	4705	4697	4
56.00	294751	294742	294734	294726	294717	294709	294701	294693	294685	294677	294
10	4731	4722	4714	4706	4697	4689	4681	4673	4665	4657	4
20	4712	4703	4695	4687	4678	4670	4662	4654	4646	4638	4
30	4692	4683	4675	4667	4658	4650	4642	4634	4626	4618	4
40	4673	4664	4656	4648	4638	4630	4622	4614	4606	4598	4
50	4653	4644	4636	4628	4619	4611	4603	4595	4587	4579	4
57.00	294633	294625	294616	294608	294599	294591	294583	294575	294567	294559	294
10	4613	4605	4596	4588	4579	4571	4563	4555	4547	4539	4
20	4594	4586	4577	4569	4569	4552	4543	4535	4527	4519	4
30	4574	4566	4557	4549	4540	4532	4523	4515	4507	4499	4
40	4555	4546	4537	4529	4520	4512	4504	4496	4488	4480	4
50	4535	4527	4518	4510	4501	4493	4484	4476	4468	4460	4
58.00	294516	294507	294498	294490	294481	294473	294465	294456	294448	294440	294
10	4496	4487	4478	4470	4461	4453	4445	4436	4428	4420	4
20	4477	4468	4459	4451	4442	4434	4426	4417	4409	4401	4
30	4457	4448	4439	4431	4422	4414	4406	4397	4389	4381	4
40	4437	4428	4419	4411	4402	4394	4386	4377	4369	4361	4
50	4418	4409	4400	4392	4383	4375	4367	4358	4349	4341	4
59.00	294398	294389	294380	294372	294363	294355	294246	294338	294329	294321	29
10	4378	4369	4360	4352	4343	4335	4326	4318	4309	4301	
20	4359	4350	4341	4333	4324	4316	4306	4298	4289	4281	
30	4339	4330	4321	4313	4304	4296	4286	4278	4269	4261	
40	4320	4311	4302	4294	4284	4276	4267	4259	4250	4242	
50	4300	4291	4282	4274	4265	4256	4247	4239	4230	4222	
60.00	294281	294272	294263	294254	294245	294236	294228	294219	294211	294202	29
10	4261	4252	4243	4234	4225	4216	4208	4199	4191	4182	
20	4242	4233	4223	4214	4206	4197	4189	4180	4172	4163	
30	4222	4213	4203	4194	4186	4177	4169	4160	4152	4143	
40	4202	4193	4183	4174	4166	4157	4149	4140	4132	4123	
50	4183	4174	4164	4155	4147	4138	4129	4121	4112	4103	
61.00	294163	294154	294145	294136	294127	294118	294109	294101	294092	294083	29
10	4143	4134	4125	4116	4107	4098	4089	4081	4072	4063	
20	4124	4115	4106	4097	4088	4079	4070	4062	4053	4044	
30	4104	4095	4086	4077	4068	4059	4050	4042	4033	4024	
40	4084	4075	4066	4057	4048	4039	4030	4022	4013	4004	
50	4065	4056	4047	4038	4029	4020	4011	4003	3994	3985	

TABLE XXXV.

LUNI-SOLAR TABLE,

For clearing the Angular Distance between the Sun, Moon, and Stars, from the effect of Refraction and Parallax.

	Moon's Apparent Altitude.						Moon's Apparent Altitude.					
	68°						69°					
h. p.	00′	10′	20′	30′	40′	50′	00′	10′	20′	30′	40′	50′
′ ″												
53.00	295011	295004	294997	294990	294983	294976	294969	294962	294955	294949	294942	[illegible]
10	4991	4984	4977	4970	4963	4956	4949	4942	4935	4929	4922	[illegible]
20	4971	4964	4957	4950	4943	4936	4929	4922	4915	4909	4902	[illegible]
30	4952	4945	4938	4931	4923	4916	4909	4902	4895	4889	4882	[illegible]
40	4932	4925	4918	4911	4903	4896	4889	4882	4875	4869	4861	[illegible]
50	4912	4905	4898	4891	4883	4876	4869	4862	4855	4849	4841	[illegible]
54.00	294893	294885	294878	294871	294863	294856	294849	294842	294835	294828	294821	[illegible]
10	4873	4865	4858	4851	4843	4836	4829	4822	4815	4808	4801	[illegible]
20	4853	4845	4838	4831	4823	4816	4809	4802	4795	4788	4781	[illegible]
30	4833	4825	4818	4811	4803	4796	4789	4782	4775	4768	4760	[illegible]
40	4813	4805	4799	4791	4783	4776	4769	4762	4755	4748	4740	[illegible]
50	4793	4785	4778	4771	4763	4756	4749	4742	4735	4728	4720	[illegible]
55.00	294773	294766	294758	294751	294743	294736	294729	294722	294714	294707	294700	[illegible]
10	4753	4746	4738	4731	4723	4716	4709	4702	4694	4687	4680	[illegible]
20	4733	4726	4718	4711	4703	4696	4689	4682	4674	4667	4660	[illegible]
30	4713	4706	4698	4691	4683	4676	4668	4661	4654	4646	4640	[illegible]
40	4694	4686	4679	4671	4664	4656	4648	4641	4634	4626	4620	[illegible]
50	4674	4666	4659	4651	4644	4636	4628	4621	4614	4607	4600	[illegible]
56.00	294654	294646	294639	294631	294624	294616	294609	294601	294594	294587	294580	[illegible]
10	4634	4626	4619	4611	4604	4596	4589	4581	4574	4567	4560	[illegible]
20	4614	4606	4599	4591	4584	4576	4569	4561	4554	4547	4540	[illegible]
30	4594	4586	4579	4571	4564	4556	4549	4541	4534	4527	4519	[illegible]
40	4575	4566	4559	4551	4544	4536	4529	4521	4514	4507	4499	[illegible]
50	4555	4546	4539	4531	4524	4516	4509	4501	4494	4487	4479	[illegible]
57.00	294535	294527	294519	294512	294504	294496	294489	294481	294474	294466	294459	[illegible]
10	4515	4507	4499	4492	4484	4476	4469	4461	4454	4446	4439	[illegible]
20	4495	4487	4479	4472	4464	4456	4449	4441	4434	4426	4419	[illegible]
30	4475	4467	4459	4452	4444	4436	4429	4421	4414	4406	4399	[illegible]
40	4456	4448	4440	4432	4424	4416	4409	4401	4394	4386	4379	[illegible]
50	4436	4428	4420	4412	4404	4396	4389	4381	4374	4366	4359	[illegible]
58.00	294416	294408	294400	294392	294384	294376	294369	294361	294353	294346	294339	[illegible]
10	4396	4388	4380	4372	4364	4356	4349	4341	4333	4326	4319	[illegible]
20	4376	4368	4360	4352	4344	4336	4329	4321	4313	4306	4299	[illegible]
30	4356	4348	4340	4332	4324	4316	4309	4301	4293	4286	4278	[illegible]
40	4336	4328	4320	4312	4304	4296	4289	4281	4273	4266	4258	[illegible]
50	4316	4308	4300	4292	4284	4276	4269	4261	4253	4246	4238	[illegible]
59.00	294296	294288	294280	294272	294264	394256	294249	294241	294233	294226	294218	294211
10	4276	4268	4260	4252	4244	4236	4229	4221	4213	4206	4198	4191
20	4256	4248	4240	4232	4224	4216	4209	4201	4193	4186	4178	4171
30	4236	4228	4220	4212	4204	4196	4189	4181	4173	4166	4157	4151
40	4217	4209	4261	4193	4184	4176	4169	4161	4153	4146	4137	4131
50	4197	4189	4181	4173	4164	4156	4149	4141	4133	4126	4117	4111
60.00	294177	294169	294161	294153	294144	294136	294129	294121	294113	294105	294097	[illegible]
10	4157	4149	4141	4133	4124	4116	4109	4101	4093	4085	4077	4070
20	4137	4129	4121	4113	4104	4096	4089	4081	4073	4065	4057	4050
30	4117	4109	4101	4093	4084	4076	4068	4060	4053	4045	4037	4030
40	4098	4089	4081	4073	4065	4057	4048	4040	4033	4025	4017	4010
50	4078	4069	4061	4053	4045	4037	4028	4020	4013	4005	3997	[illegible]
61.00	294058	294049	294941	294033	294025	294017	294008	294000	293993	293985	293977	[illegible]
10	4038	4029	4021	4013	4005	3997	3988	3980	3973	3965	3957	3949
20	4018	4009	4001	3993	3985	3977	3968	3960	3953	3945	3937	3929
30	3998	3989	3981	3973	3965	3957	3947	3939	3932	3924	3917	3909
40	3979	3969	3961	3953	3946	3938	3927	3919	3912	3904	3897	[illegible]
50	3959	3949	3941	3933	3926	3918	3907	3899	3892	3884	3877	[illegible]

TABLE XXXV.

LUNI-SOLAR TABLE,

or clearing the Angular Distance between the Sun, Moon, and Stars, from the effect of Refraction and Parallax.

Moon's Apparent Altitude.						Moon's Apparent Altitude.					
70°						71°					
00′	10′	20′	30′	40′	50′	00′	10′	20′	30′	40′	50′
294927	294921	294915	294907	294901	294895	294889	294883	294877	294870	294864	294858
4907	4901	4895	4887	4881	4875	4869	4863	4857	4850	4844	4838
4887	4881	4875	4867	4861	4855	4848	4842	4836	4829	4823	4817
4867	4861	4855	4847	4841	4835	4828	4822	4816	4809	4803	4797
4646	4840	4834	4826	4820	4814	4808	4802	4796	4789	4783	4777
4826	4820	4814	4806	4800	4794	4787	4781	4775	4768	4762	4756
294807	294800	294794	294787	294780	294774	294767	294761	294755	294748	294742	294736
4787	4780	4774	4767	4760	4754	4747	4741	4735	4728	4722	4716
4767	4760	4754	4747	4740	4734	4726	4720	4715	4708	4701	4695
4746	4739	4733	4726	4719	4713	4706	4700	4695	4688	4681	4675
4726	4719	4713	4706	4699	4693	4686	4680	4675	4668	4661	4655
4706	4699	4693	4686	4679	4673	4665	4659	4654	4647	4640	4634
294686	294679	294673	294666	294659	294652	294646	294639	294633	294626	294620	294614
4666	4659	4653	4646	4639	4632	4626	4619	4613	4606	4600	4594
4646	4639	4633	4626	4619	4612	4606	4599	4593	4586	4579	4573
4626	4619	4613	4606	4598	4591	4585	4578	4572	4565	4559	4553
4606	4599	4593	4586	4578	4571	4565	4558	4552	4545	4539	4533
4586	4579	4573	4566	4558	4551	4545	4538	4532	4525	4518	4512
294566	294559	294552	294545	294538	294531	294524	294518	294511	294504	294498	294491
4546	4539	4532	4525	4518	4511	4504	4498	4491	4484	4478	4471
4526	4519	4512	4505	4498	4491	4483	4477	4471	4464	4457	4450
4505	4498	4491	4484	4477	4470	4463	4457	4451	4444	4437	4430
4485	4478	4471	4464	4457	4450	4443	4437	4431	4424	4417	4410
4465	4458	4451	4444	4437	4430	4422	4416	4410	4403	4396	4389
294445	294438	294431	294424	294417	294410	294403	294396	294389	294383	294376	294369
4225	4418	4411	4404	4397	4390	4383	4376	4369	4363	4356	4349
4205	4398	4391	4384	4376	4369	4362	4355	4348	4342	4335	4328
4185	4377	4370	4363	4356	4349	4342	4335	4328	4322	4315	4308
4165	4357	4350	4343	4336	4329	4322	4315	4308	4302	4295	4288
4145	4337	4330	4323	4315	4308	4301	4294	4287	4281	4274	4267
294324	294317	294309	294302	294295	294288	294281	294274	294267	294261	294254	294247
4304	4297	4289	4282	4275	4268	4261	4254	4247	4241	4234	4227
4284	4277	4269	4262	4255	4248	4241	4234	4227	4221	4213	4206
4263	4256	4248	4241	4234	4227	4220	4213	4206	4200	4193	4186
4243	4236	4228	4221	4214	4207	4200	4193	4186	4180	4173	4166
4223	4216	4208	4201	4194	4187	4180	4173	4166	4160	4152	4145
294203	294996	294188	294181	294174	294167	294160	294153	294146	294139	294132	294125
4183	4176	4168	4161	4154	4147	4140	4133	4126	4119	4112	4105
4163	4156	4148	4141	4134	4127	4119	4112	4105	4098	4091	4084
4142	4135	4127	4120	4113	4106	4099	4092	4085	4078	4071	4064
4122	4115	4107	4100	4093	4086	4079	4072	4065	4058	4050	4043
4102	4095	4087	4080	4073	4066	4058	4051	4044	4037	4030	4023
294082	294075	294067	294060	294053	294046	294038	294031	294024	294017	294010	294003
4062	4055	4047	4040	4033	4026	4018	4011	4004	3997	3990	3983
4042	4035	4027	4020	4013	4006	3997	3990	3983	3976	3969	3962
4022	4014	4006	3999	3992	3985	3977	3970	3963	3956	3949	3942
4002	3994	3986	3979	3972	3965	3957	3950	3943	3936	3929	3922
3982	3974	3966	3959	3952	3945	3936	3929	3922	3915	3908	3901
293961	293954	293946	293939	293932	293924	293917	293909	293902	293995	293888	293881
3941	3934	3926	3919	3912	3904	3897	3889	3881	3875	3868	3861
3921	3914	3906	3899	3892	3884	3876	3868	3861	3854	3847	3840
3901	3893	3885	3878	3871	3863	3856	3848	3841	3834	3827	3820
3881	3873	3865	3858	3851	3843	3836	3828	3821	3814	3807	3800
3861	3853	3845	3838	3831	3823	3815	3807	3801	3793	3786	3779

TABLE XXXV.

LUNI-SOLAR TABLE,

For clearing the Angular Distance between the Sun, Moon, and Stars, f
the effect of Refraction and Parallax.

	Moon's Apparent Altitude.						Moon's Apparent Altitude.				
	72°						73°				
h· p.	00′	10′	20′	30′	40′	50′	00′	10′	20′	30′	40′
′ ″											
53.00	294852	294847	294841	294825	294830	294824	294818	294812	294806	294800	2947
10	4832	4826	4821	4805	4809	4803	4797	4791	4785	4779	47
20	4811	4806	4800	4794	4788	4782	4776	4770	4764	4758	4
30	4791	4785	4779	4773	4768	4762	4756	4750	4744	4738	4
40	4771	4765	4759	4753	4747	4741	4735	4729	4723	4717	
50	4750	4745	4739	4733	4727	4721	4715	4709	4703	4697	
54.00	294730	294724	294718	294712	294706	294700	294694	294688	294682	294677	29
10	4710	4703	4697	4691	4685	4679	4673	4667	4661	4656	
20	4689	4683	4677	4671	4665	4659	4653	4647	4641	4636	
30	4669	4662	4656	4650	4644	4638	4632	4626	4620	4615	
40	4648	4642	4636	4630	4624	4618	4612	4606	4600	4595	
50	4628	4621	4615	4609	4603	4597	4591	4585	4579	4574	
55.00	294607	294601	294595	294587	294583	294577	294571	294565	294559	294553	2
10	4587	4581	4575	4567	4562	4556	4550	4544	4538	4532	45
20	4566	4560	4554	4546	4542	4536	4530	4524	4518	4512	45
30	4546	4540	4534	4526	4521	4515	4509	4503	4497	4491	44
40	4526	4520	4514	4506	4501	4495	4489	4483	4477	4471	446
50	4505	4499	4493	4485	4480	4474	4468	4462	4456	4450	4445
56.00	294485	294479	294473	294465	294460	294454	294448	294442	294436	294430	29442
10	4465	4458	4452	4445	4439	4433	4427	4421	4415	4409	4403
20	4444	4438	4432	4425	4419	4413	4407	4401	4395	4389	4383
30	4124	4417	4411	4404	4398	4392	4386	4380	4374	4368	4362
40	4401	4397	4391	4384	4378	4372	4366	4360	4354	4348	4342
50	4383	4376	4370	4364	4357	4351	4345	4339	4333	4327	4321
57.00	294363	294356	294350	294344	294337	294331	294325	294319	294313	294307	294301
10	4343	4336	4330	4324	4316	4310	4304	4298	4292	4286	4280
20	4322	4315	4309	4303	4296	4290	4284	4278	4272	4266	4260
30	4302	4295	4289	4283	4275	4269	4263	4257	4251	4245	4239
40	4282	4275	4269	4263	4255	4249	4243	4237	4231	4225	4219
50	4261	4254	4248	4242	4234	4228	4222	4216	4210	4204	4198
58.00	294241	294234	294228	294221	294214	294208	294202	294196	294190	294184	294178
10	4221	4214	4208	4201	4194	4188	4181	4175	4169	4163	4157
20	4200	4193	4187	4180	4173	4167	4161	4155	4149	4143	4137
30	4180	4173	4167	4160	4153	4147	4140	4134	4128	4122	4116
40	4160	4153	4147	4140	4133	4127	4120	4114	4108	4102	4095
50	4139	4132	4126	4119	4112	4106	4099	4093	4037	4081	4075
59.00	294118	294112	294105	294098	294092	294086	294079	294073	294067	294060	294054
10	4098	4091	4084	4077	4071	4065	4058	4052	4046	4039	4033
20	4077	4071	4064	4057	4051	4045	4038	4032	4026	4019	4013
30	4057	4050	4043	4036	4030	4024	4017	4011	4005	3998	3992
40	4036	4030	4023	4016	4010	4004	3997	3991	3985	3978	3972
50	4016	4009	4002	3995	3989	3983	3976	3970	3964	3957	3951
60.00	293996	293989	293982	293976	293969	293963	293956	293950	293943	293937	293931
10	3976	3969	3962	3956	3949	3943	3935	3929	3922	3916	3910
20	3955	3948	3941	3935	3928	3922	3915	3909	3902	3896	3890
30	3935	3928	3921	3915	3908	3902	3894	3888	3881	3875	3869
40	3915	3908	3901	3894	3888	3882	3874	3868	3861	3855	3849
50	3894	3887	3880	3874	3867	3861	3853	3847	3841	3835	3828
61.00	293874	293867	293860	293853	293847	293840	293833	293827	293820	293814	293808
10	3854	3847	3840	3833	3827	3820	3812	3806	3799	3793	3787
20	3833	3826	3819	3812	3806	3799	3792	3786	3779	3773	3767
30	3813	3806	3799	3792	3786	3779	3771	3765	3758	3752	3746
40	3793	3786	3779	3772	3766	3759	3751	3745	3738	3732	3726
50	3772	3765	3758	3751	3745	3738	3730	3724	3717	3711	3705

TABLE XXXV.

LUNI-SOLAR TABLE,

r clearing the Angular Distance between the Sun, Moon, and Stars, from the effect of Refraction and Parallax.

Moon's Apparent Altitude.						Moon's Apparent Altitude.					
74°						75°					
00′	10′	20′	30′	40′	50′	00′	10′	20′	30′	40′	50
294785	294779	294773	294769	294763	294757	294752	294747	294742	294737	294732	2947
4764	4758	4752	4748	4742	4736	4731	4726	4721	4716	4711	47
4743	4738	4732	4728	4722	4716	4711	4706	4700	4696	4691	46
4723	4717	4711	4707	4701	4695	4689	4684	4679	4675	4670	46
4702	4696	4690	4686	4680	4674	4669	4664	4659	4654	4649	46
4682	4676	4670	4666	4660	4654	4649	4644	4639	4634	4629	46
294660	294655	294649	294644	294639	294633	294628	294623	294618	294613	294608	2946
4639	4634	4628	4623	4618	4612	4607	4602	4597	4592	4587	45
4619	4614	4608	4603	4598	4592	4587	4582	4577	4572	4567	45
4598	4593	4587	4582	4577	4571	4566	4561	4556	4551	4546	45
4578	4573	4566	4562	4556	4550	4545	4540	4535	4530	4525	45
4557	4552	4546	4541	4536	4530	4525	4520	4515	4510	4505	45
294536	294531	294525	294520	294515	294509	294504	294499	294494	294489	294484	2944
4515	4510	4504	4499	4494	4488	4483	4478	4473	4468	4463	44
4495	4490	4484	4479	4474	4468	4463	4458	4453	4448	4442	44
4474	4469	4463	4458	4453	4457	4442	4437	4432	4427	4421	441
4453	4148	4442	4437	4432	4426	4421	4416	4411	4406	4401	43
4433	4428	4422	4417	4412	4406	4401	4396	4390	4385	4380	43
294413	294407	294402	294396	294391	294385	294380	294375	294369	294364	294359	2943
4392	4386	4381	4375	4370	4364	4359	4354	4348	4343	4338	43
4372	4366	4361	4355	4350	4344	4338	4333	4328	4323	4318	431
4351	4345	4340	4334	4329	4323	4317	4312	4307	4302	4297	42
4331	4325	4320	4314	4308	4302	4297	4292	4286	4281	4276	42
4310	4304	4299	4293	4288	4282	4276	4271	4265	4260	4256	42
294289	294284	294278	294272	294267	294261	294256	294250	294245	294240	294235	2942
4268	4263	4257	4251	4246	4240	4235	4229	4224	4219	4214	42
4248	4243	4237	4231	4226	4220	4215	4209	4204	4199	4193	41
4227	4222	4216	4210	4205	4199	4194	4188	4183	4178	4172	41
4207	4201	4195	4189	4184	4178	4173	4167	4162	4157	4152	41
4186	4181	4175	4169	4164	4158	4153	4147	4142	4136	4131	41
294166	294160	294154	294148	294143	294137	294132	294126	294121	294115	294110	2941
4145	4139	4133	4127	4122	4116	4111	4105	4100	4094	4089	40
4125	4119	4113	4107	4102	4096	4091	4085	4080	4074	4069	40
4104	4098	4092	4086	4081	4075	4070	4064	4059	4053	4048	40
4083	4077	4071	4065	4060	4054	4049	4043	4038	4032	4027	40
4063	4057	4051	4045	4040	4034	4029	4023	4017	4012	4007	40
294042	294036	294030	294024	294019	294013	294007	294002	293996	293991	293986	2939
4021	4015	4009	4003	3998	3992	3986	3981	3975	3970	3965	39
4001	3995	3989	3983	3978	3972	3966	3961	3955	3950	3944	39
3980	3974	3968	3962	3957	3951	3945	3940	3934	3929	3923	391
3960	3954	3948	3942	3936	3930	3924	3919	3913	3908	3903	38
3939	3933	3927	3921	3916	3910	3903	3898	3893	3888	3882	38
293919	293913	293907	293901	293895	293889	293883	293878	293872	293867	293861	2938
3898	3892	3886	3880	3874	3868	3862	3857	3851	3846	3840	38
3878	3872	3866	3860	3854	3848	3841	3836	3830	3825	3820	381
3857	3851	3845	3839	3833	3827	3820	3815	3809	3804	3799	37
3837	3830	3824	3818	3812	3806	3800	3795	3789	3784	3778	37
3816	3810	3804	3798	3792	3786	3779	3774	3768	3763	3758	37
293795	293789	293783	293777	293771	293765	293759	293753	293748	293742	293737	2937
3774	3768	3762	3756	3750	3744	3738	3732	3727	3721	3716	371
3754	3748	3742	3736	3730	3724	3717	3711	3706	3700	3696	36
3733	3727	3721	3715	3709	3703	3696	3690	3685	3679	3675	36
3713	3706	3700	3694	3688	3682	3676	3670	3665	3659	3654	36
3692	3686	3680	3674	3668	3662	3655	3649	3644	3638	3633	36

TABLE XXXV.

LUNI-SOLAR TABLE,

For clearing the Angular Distance between the Sun, Moon, and Stars, fro
the effect of Refraction and Parallax

	Moon's Apparent Altitude.						Moon's Apparent Altitude.				
	76°						77°				
h. p.	00′	10′	20′	30′	40′	50′	00′	10′	20′	30′	40′
′ ″											
53.00	294724	294719	294714	294710	294705	294700	294695	294691	294687	294682	294678
10	4703	4698	4693	4689	4684	4679	4674	4670	4666	4661	4657
20	4682	4677	4672	4668	4663	4658	4653	4649	4645	4640	4636
30	4662	4657	4652	4448	4643	4638	4633	4629	4625	4620	461
40	4641	4636	4631	4427	4622	4617	4612	4608	4604	4599	4595
50	4620	4615	4610	4406	4601	4596	4591	4587	4583	4578	4574
54.00	294598	294594	294589	294584	294580	294575	294571	294566	294562	294557	294553
10	4577	4573	4568	4563	4559	4554	4550	4545	4541	4536	4532
20	4557	4552	4547	4542	4538	4533	4529	4524	4520	4515	4512
30	4536	4531	4526	4521	4517	4512	4508	4503	4499	4494	4490
40	4515	4511	4506	4501	4497	4492	4488	4483	4479	4474	4470
50	4495	4490	4485	4480	4476	4471	4467	4462	4458	4453	4449
55.00	294474	294469	294464	294459	294455	294450	294445	294441	294436	294432	294428
10	4453	4448	4443	4438	4434	4429	4424	4420	4415	4411	4407
20	4432	4427	4422	4417	4413	4408	4403	4399	4394	4390	4386
30	4411	4406	4401	4396	4392	4387	4382	4378	4373	4369	4365
40	4391	4386	4381	4376	4372	4367	4361	4357	4352	4348	4344
50	4370	4365	4360	4355	4351	4346	4340	4336	4331	4327	4323
56.00	294349	294344	294339	294334	294330	294325	294320	294315	294311	294306	294302
10	4328	4323	4318	4313	4309	4304	4299	4294	4290	4285	4281
20	4308	4302	4297	4292	4288	4283	4278	4273	4269	4264	4260
30	4287	4281	4276	4271	4267	4262	4257	4252	4248	4243	4239
40	4266	4261	4256	4251	4246	4241	4237	4232	4228	4223	4218
50	4246	4240	4235	4230	4225	4220	4216	4211	4207	4202	4197
57.00	294224	294219	294214	294209	294204	294200	294195	294190	294186	294181	294176
10	4203	4198	4193	4188	4183	4179	4174	4169	4165	4160	4155
20	4182	4177	4172	4167	4162	4158	4153	4148	4144	4139	4134
30	4161	4156	4151	4146	4141	4137	4132	4127	4123	4118	4113
40	4141	4136	4131	4126	4121	4117	4112	4107	4103	4098	4093
50	4120	4115	4110	4105	4100	4096	4091	4086	4082	4077	4072
58.00	294100	294094	294089	294084	294079	294075	294070	294065	294060	294056	294051
10	4079	4073	4068	4063	4058	4054	4049	4044	4039	4035	4030
20	4059	4053	4048	4043	4037	4033	4028	4023	4018	4014	4009
30	4038	4032	4027	4022	4016	4012	4007	4002	3997	3993	3988
40	4017	4011	4006	4001	3996	3991	3987	3982	3977	3973	3967
50	3996	3991	3986	3980	3975	3970	3966	3961	3956	3952	3946
59.00	293975	293970	293965	293959	293954	293949	293944	293940	293935	293930	293925
10	3954	3949	3944	3938	3933	3928	3923	3919	3914	3909	3904
20	3933	3928	3923	3917	3912	3907	3902	3898	3893	3888	3883
30	3912	3907	3902	3896	3891	3886	3881	3877	3872	3867	3862
40	3892	3887	3882	3876	3871	3866	3860	3856	3851	3846	3842
50	3871	3866	3861	3855	3850	3845	3839	3835	3830	3825	3821
60.00	293850	293845	293840	293834	293829	293824	293819	293814	293809	293805	293800
10	3829	3824	3819	3813	3808	3803	3798	3793	3788	3784	3779
20	3809	3803	3798	3792	3787	3782	3777	3772	3767	3763	3758
30	3788	3782	3777	3771	3766	3761	3756	3751	3746	3742	3737
40	3767	3762	3757	3751	3746	3741	3736	3731	3726	3722	3716
50	3746	3741	3736	3730	3725	3720	3715	3710	3705	3701	3695
61.00	293725	293720	293715	293709	293704	293699	293694	293689	293684	293679	293674
10	3704	3699	3694	3688	3682	3678	3673	3668	3663	3658	3653
20	3684	3678	3673	3667	3662	3657	3652	3647	3642	3637	3632
30	3663	3657	3652	3646	3641	3636	3631	3626	3621	3616	3611
40	3642	3637	3632	3626	3621	3616	3610	3606	3601	3596	3590
50	3622	3616	3610	3604	3600	3595	3590	3585	3580	3575	356

LUNI-SOLAR TABLE,

For clearing the Angular Distance between the Sun, Moon, and Stars, from the effect of Refraction and Parallax.

	Moon's Apparent Altitude.						Moon's Apparent Altitude.					
	78°						79°					
h. p.	00′	10′	20′	30′	40′	50′	00′	10′	20′	30′	40′	50′
′ ″												
53.00	294671	294667	294663	294659	294655	294651	294647	294644	294641	294636	294633	29463
10	4650	4656	4642	4638	4634	4630	4626	4623	4620	4615	4612	46
20	4629	4625	4621	4617	4613	4609	4605	4602	4600	4594	4591	45
30	4609	4604	4600	4596	4592	4588	4584	4581	4578	4573	4570	45
40	4588	4583	4579	4575	4571	4567	4562	4559	4556	4551	4548	45
50	4567	4562	4559	4555	4550	4546	4541	4538	4535	4530	4527	45
54.00	294545	294541	294537	294533	294529	294525	294521	294517	294514	294510	294506	2945
10	4524	4520	4516	4512	4508	4504	4500	4496	4493	4489	4485	44
20	4504	4499	4495	4491	4487	4483	4479	4475	4472	4468	4464	44
30	4482	4478	4474	4470	4466	4462	4458	4454	4451	4447	4443	44
40	4462	4457	4453	4449	4445	4441	4437	4433	4430	4426	4422	44
50	4441	4436	4432	4428	4424	4420	4416	4412	4409	4405	4401	43
55.00	294419	294415	294411	294407	294403	294399	294395	294391	294387	294384	294380	2943
10	4398	4394	4390	4386	4382	4378	4374	4370	4366	4363	4359	43
20	4377	4373	4369	4365	4361	4357	4353	4349	4345	4342	4338	43
30	4356	4352	4348	4344	4340	4336	4332	4328	4324	4321	4317	43
40	4335	4331	4327	4323	4319	4315	4311	4307	4303	4300	4296	42
50	4314	4310	4306	4302	4298	4294	4290	4286	4282	4279	4275	42
56.00	294293	294289	294285	294281	294277	294273	294269	294265	294261	294257	294254	2942
10	4272	4268	4264	4260	4256	4252	4248	4244	4240	4236	4233	42
20	4251	4247	4243	4239	4235	4231	4227	4223	4219	4215	4212	42
30	4230	4226	4222	4218	4214	4210	4206	4202	4198	4194	4190	41
40	4209	4205	4201	4197	4193	4189	4185	4181	4177	4173	4169	41
50	4188	4184	4180	4176	4172	4168	4164	4160	4156	4152	4148	41
57.00	294168	294163	294159	294155	294151	294147	294143	294139	294135	294131	294127	2941
10	4147	4142	4138	4134	4130	4126	4122	4118	4114	4110	4106	41
20	4126	4121	4117	4113	4109	4105	4101	4097	4093	4089	4085	40
30	4105	4100	4096	4092	4088	4084	4080	4076	4072	4068	4064	40
40	4085	4080	4076	4072	4067	4063	4059	4055	4051	4047	4043	40
50	4064	4059	4055	4051	4046	4042	4038	4034	4030	4026	4022	40
58.00	294042	294038	294033	294029	294025	294021	294017	294013	294009	294005	294400	2939
10	4021	4017	4012	4008	4004	4000	3896	3992	3988	3984	3980	39
20	4000	3996	3991	3987	3983	3979	3875	3971	3967	3963	3959	39
30	3979	3975	3970	3966	3962	3956	3854	3950	3946	3942	3937	39
40	3958	3954	3949	3945	3941	3937	3833	3929	3925	3921	3916	39
50	3937	3933	3928	3924	3920	3916	3811	3907	3903	3899	3895	38
59.00	293916	293912	293907	293903	293899	293895	293891	293886	293882	293878	293874	2938
10	3895	3891	3886	3882	3878	3874	3870	3865	3861	3857	3853	38
20	3874	3870	3865	3861	3857	3853	3849	3844	3840	3836	3832	38
30	2853	3849	3844	3840	3836	3832	3828	3823	3819	3815	3811	38
40	3833	3828	3823	3819	3815	3811	3807	3802	3798	3794	3790	37
50	3812	3807	3802	3798	3794	3790	3786	3781	3777	3773	3769	37
60.00	293791	293786	293782	293777	293773	293769	293764	293760	293756	293752	293748	2937
10	3770	3765	3761	3756	3752	3748	3743	3739	3735	3731	3727	37
20	3749	3744	3740	3735	3731	3727	3722	3718	3714	3710	3706	37
30	3728	3723	3719	3714	3710	3706	3701	3697	3693	3689	3685	36
40	3707	3702	3698	3693	3689	3685	3680	3676	3672	3668	3664	36
50	3686	3681	3677	3672	3668	3664	3660	3655	3651	3647	3643	36
61.00	293665	293660	293656	293651	293647	293643	293638	293634	293630	293626	293622	2936
10	3644	3639	3635	3630	3626	3622	3617	3613	3609	3605	3601	35
20	3623	3618	3614	3609	3605	3601	3596	3592	3588	3584	3580	35
30	3602	3597	3593	3588	3584	3581	3575	3571	3567	3563	3559	35
40	3581	3576	3572	3567	3563	3559	3554	3550	3546	3542	3538	35
50	3560	3555	3551	3546	3542	3538	3533	3529	3525	3521	3517	35

TABLE XXXV.

LUNI-SOLAR TABLE,

For clearing the Angular Distance between the Sun, Moon, and Stars, from the effect of Refraction and Parallax.

	Moon's Apparent Altitude.						Moon's Apparent Altitude.					
	80°						81°					
h. p. ′ ″	00′	10′	20′	30′	40′	50′	00′	10	20′	30′	40′	50
53.00	294626	294623	204620	294616	294613	294610	294607	294604	294601	294598	294595	[illegible]
10	4605	4602	4599	4595	4592	4589	4586	4583	4580	4577	4574	[illegible]
20	4584	4581	4578	4574	4571	4568	4565	4562	4559	4556	4553	[illegible]
30	4563	4560	4557	4553	4550	4547	4544	4541	4538	4535	4532	[illegible]
40	4541	4538	4535	4531	4528	4525	4522	4519	4516	4513	4510	[illegible]
50	4520	4517	4514	4510	4507	4504	4501	4498	4495	4492	4489	[illegible]
54.00	294499	294496	294493	294489	294486	294483	294480	294477	294474	294471	294468	[illegible]
10	4478	4475	4472	4468	4465	4462	4459	4456	4453	4450	4447	[illegible]
20	4457	4454	4451	4447	4444	4441	4138	4435	4432	4429	4426	[illegible]
30	4436	4432	4429	4425	4422	4419	4416	4413	4411	4408	4404	[illegible]
40	4415	4411	4408	4404	4401	4398	4395	4392	4389	4386	4383	[illegible]
50	4394	4390	4387	4383	4380	4377	4374	4371	4368	4365	4362	[illegible]
55.00	294372	294369	294366	294362	294359	294456	294353	294350	294347	294344	294341	[illegible]
10	4351	4348	4345	4341	4338	4335	4332	4329	4326	4323	4320	[illegible]
20	4330	4327	4324	4320	4317	4314	4311	4308	4305	4302	4298	[illegible]
30	4309	4306	4303	4299	4295	4292	4289	4286	4283	4280	4277	[illegible]
40	4288	4285	4282	4278	4274	4271	4268	4265	4262	4259	4256	[illegible]
50	4267	4264	4261	4257	4253	4250	4247	4244	4241	4238	4234	[illegible]
56.00	294246	294243	294239	294236	294232	294229	294226	294223	294219	294216	294213	[illegible]
10	4225	4222	4218	4215	4211	4208	4205	4202	4198	4195	4192	[illegible]
20	4201	4201	4197	4194	4190	4187	4184	4181	4177	4174	4171	[illegible]
30	4184	4179	4175	4172	4169	4166	4162	4159	4155	4152	4149	[illegible]
40	4161	4158	4154	4151	4148	4145	4141	4138	4134	4131	4128	[illegible]
50	4140	4137	4133	4130	4127	4124	4120	4117	4112	4110	4107	[illegible]
57.00	294120	294116	294113	294109	294106	294103	294099	294096	294092	294089	294086	[illegible]
10	4099	4095	4092	4088	4085	4081	4078	4075	4071	4068	4065	[illegible]
20	4078	4074	4071	4067	4064	4060	4058	4054	4050	4047	4044	[illegible]
30	4057	4053	4050	4046	4042	4038	4036	4032	4028	4025	4022	[illegible]
40	4036	4032	4029	4025	4021	4017	4015	4011	4007	4004	4001	[illegible]
50	4015	4011	4008	4004	4000	3996	3994	3990	3986	3983	3986	[illegible]
58.00	293993	293990	293986	293982	293979	293975	293972	293769	293965	293962	293959	[illegible]
10	3972	3969	3965	3961	3958	3954	3951	3948	3944	3941	3938	[illegible]
20	3951	3948	3944	3940	3937	3933	3930	3927	3923	3920	3917	[illegible]
30	3929	3926	3922	3918	3915	3911	3908	3906	3901	3898	3895	[illegible]
40	3908	3905	3901	3897	3894	3890	3887	3884	3880	3877	3874	[illegible]
50	3887	3884	3880	3876	3873	3869	3866	3863	3859	3856	3853	[illegible]
59.00	293867	293863	293859	293856	293852	293849	293845	293842	293838	393835	293832	[illegible]
10	3846	3842	3838	3835	3831	3828	3824	3821	3817	3814	3811	[illegible]
20	3825	3821	3817	3814	3810	3807	3803	3800	3796	3793	3790	[illegible]
30	3804	3799	3795	3792	3788	3785	3781	3778	3774	3771	3768	[illegible]
40	3783	3778	3774	3771	3767	3764	3760	3757	3753	3750	3747	[illegible]
50	3762	3757	3753	3750	3746	3743	3739	3736	3732	3729	3726	[illegible]
60.00	293740	293736	293733	293729	293725	293722	293718	293715	293711	293708	293705	[illegible]
10	3719	3715	3712	3708	3704	3701	3697	3694	3690	3687	3684	[illegible]
20	3698	3694	3691	3687	3683	3680	3676	3673	3669	3666	3663	[illegible]
30	3677	3673	3670	3666	3661	3658	3654	3651	3647	3644	3641	[illegible]
40	3656	3652	3649	3645	3640	3637	3633	3630	3626	3623	3620	[illegible]
50	3635	3631	3628	3624	3619	3616	3612	3609	3605	3602	3599	[illegible]
61.00	293614	293610	293606	293602	293598	293595	293591	293588	293584	293581	293578	[illegible]
10	3593	3589	3585	3581	3577	3574	3570	3567	3563	3560	3557	[illegible]
20	3572	3568	3564	3560	3556	3553	3549	3546	3542	3539	3536	[illegible]
30	3551	3547	3543	3539	3534	3531	3527	3524	3520	3517	3514	[illegible]
40	3530	3526	3522	3518	3513	3510	3506	3503	3499	3496	3493	[illegible]
50	3509	3505	3501	3497	3493	3489	3485	3482	3478	3475	3472	[illegible]

TABLE XXXV.

LUNI-SOLAR TABLE,

For clearing the Angular Distance between the Sun, Moon, and Stars, fron the effect of Refraction and Parallax.

	Moon's Apparent Altitude.						Moon's Apparent Altitude.					
	82°						83°					
h. p. ′ ″	00′	10′	20′	30′	40′	50′	00′	10′	20′	30′	40′	5
53.00	294588	294586	294584	294580	294578	294576	294573	294571	294569	294566	294564	294
10	4567	4565	4563	4559	4557	4555	4552	4550	4548	4545	4543	4
20	4546	4544	4542	4538	4536	4534	4531	4529	4527	4523	4522	4
30	4525	4523	4521	4517	4515	4513	4510	4508	4506	4503	4501	4
40	4503	4501	4499	4495	4493	4491	4488	4486	4484	4481	4479	4
50	4482	4480	4478	4474	4472	4470	4467	4465	4463	4460	4458	4
54.00	294462	294459	294457	294454	294451	294449	294447	294444	294442	294440	294437	294
10	4441	4438	4436	4433	4430	4428	4426	4423	4421	4419	4416	4
20	4420	4417	4415	4412	4409	4407	4405	4402	4400	4398	4395	4
30	4398	4395	4393	4390	4387	4385	4383	4380	4378	4376	4373	4
40	4377	4374	4372	4369	4366	4364	4362	4359	4357	4355	4352	4
50	4356	4353	4351	4348	4345	4343	4341	4338	4336	4334	4331	4
55.00	294335	294332	294329	294327	294324	294322	294319	294317	294314	294312	294310	294
10	4314	4311	4308	4305	4303	4301	4298	4296	4293	4291	4289	4
20	4292	4290	4287	4285	4282	4280	4276	4274	4271	4269	4267	4
30	4271	4268	4265	4263	4260	4258	4255	4253	4250	4248	4246	4
40	4250	4247	4244	4242	4239	4237	4234	4232	4229	4227	4225	4
50	4229	4226	4223	4221	4218	4216	4212	4210	4207	4205	4203	4
56.00	294208	294205	294202	294199	294197	294194	294192	294189	294187	294184	294182	294
10	4187	4184	4181	4178	4176	4173	4171	4168	4166	4163	4161	4
20	4166	4162	4159	4156	4154	4151	4150	4147	4145	4142	4139	4
30	4144	4141	4138	4135	4133	4130	4128	4125	4123	4120	4118	4
40	4123	4120	4117	4114	4112	4109	4107	4104	4102	4099	4097	4
50	4102	4098	4095	4092	4090	4087	4086	4083	4081	4078	4075	4
57.00	294080	294077	294075	294072	294069	294067	294064	294062	294059	294057	294054	294
10	4059	4056	4054	4051	4048	4046	4043	4041	4038	4036	4033	4
20	4038	4035	4033	4030	4027	4025	4021	4019	4016	4014	4012	4
30	4016	4013	4011	4008	4005	4003	4000	4998	3995	3993	3990	3
40	3995	3992	3990	3987	3984	3982	3979	3977	3974	3972	3969	3
50	3974	3971	3969	3966	3963	3961	3957	3955	3952	3950	3948	3
58.00	293953	293950	293947	293945	293942	293939	293937	293934	293931	293929	293927	293
10	3932	3929	3926	3924	3921	3918	3916	3913	3910	3908	3906	3
20	3911	3908	3905	3903	3899	3896	3894	3891	3889	3887	3884	3
30	3889	3886	3883	3881	3878	3875	3873	3870	3867	3865	3863	3
40	3868	3865	3862	3860	3857	3854	3852	3849	3846	3844	3842	3
50	3847	3844	3841	3839	3835	3832	3830	3827	3825	3823	3820	3
59.00	293826	293823	293820	293817	293814	293812	293809	293806	293804	293801	293799	293
10	3805	3802	3799	3796	3793	3791	3788	3785	3783	3780	3778	3
20	3784	3781	3778	3775	3772	3770	3767	3764	3761	3758	3756	3
30	3763	3759	3756	3753	3750	3748	3745	3742	3740	3737	3735	3
40	3741	3738	3735	3732	3729	3727	3724	3721	3719	3716	3714	3
50	3720	3717	3714	3711	3708	3706	3703	3700	3697	3694	3692	3
60.00	293699	293696	293693	293690	293687	293684	293682	293679	293676	293664	293671	293
10	3678	3675	3672	3669	3666	3663	3661	3658	3655	3653	3650	3
20	3657	3654	3651	3648	3645	3642	3639	3636	3633	3631	3629	3
30	3635	3632	3629	3626	3623	3620	3618	3615	3612	3610	3607	3
40	3614	3611	3608	3605	3602	3599	3597	3594	3591	3589	3586	3
50	3593	3590	3587	3584	3581	3578	3576	3572	3569	3567	3565	3
61.00	293572	293569	293566	293563	293560	298557	293554	293551	293549	293546	293544	293
10	3551	3548	3545	3542	3539	3536	3533	3530	3528	3525	3523	3
20	3530	3527	3524	2521	3518	3515	3511	3508	3506	3503	3502	3
30	3509	3505	3502	3499	3496	3493	3490	3487	3485	3482	3480	3
40	3488	3484	3481	3478	3475	3472	3469	3466	3464	3461	3459	3
50	3466	3463	3460	3457	3454	3451	3447	3444	3442	3439	3438	3

TABLE XXXV.

LUNI-SOLAR TABLE,

For clearing the Angular Distance between the Sun, Moon, and Stars, the effect of Refraction and Parallax.

	Moon's Apparent Altitude.						Moon's Apparent Altitude.				
	84°						85°				
h. p.	00′	10′	20′	30′	40′	50′	00′	10′	20′	30′	40′
′ ″											
53.00	294560	294558	294556	294554	294552	294550	294549	294548	294546	294545	294543
10	4540	4538	4536	4534	4531	4529	4528	4527	4525	4524	4522
20	4518	4516	4514	4512	4510	4508	4507	4505	4503	4502	4500
30	4497	4495	4493	4491	4489	4487	4486	4484	4482	4481	4479
40	4476	4474	4472	4470	4467	4465	4465	4463	4461	4460	4458
50	4455	4452	4450	4448	4446	4444	4443	4441	4439	4438	4436
54.00	294433	294431	294429	294427	294425	294423	204422	294420	294418	294417	294415
10	4412	4410	4408	4406	4404	4402	4401	4399	4397	4396	4394
20	4391	4388	4386	4384	4382	4380	4379	4377	4375	4374	4372
30	4379	4367	4365	4363	4361	4359	4358	4356	4354	4353	4351
40	4358	4346	4344	4342	4340	4338	4337	4335	4333	4332	4330
50	4337	4324	4322	4320	4318	4316	4315	4313	4311	4309	4308
55.00	294305	294303	294301	294299	294297	294295	294294	294292	294290	294289	294287
10	4284	4282	4280	4278	4276	4274	4273	4271	4269	4268	4266
20	4262	4260	4258	4256	4254	4252	4251	4249	4247	4246	4244
30	4241	4239	4237	4235	4233	4231	4230	4228	4226	4225	4223
40	4220	4218	4216	4214	4212	4210	4209	4207	4205	4204	4202
50	4198	4196	4194	4192	4190	4188	4187	4185	4183	4182	4180
56.00	294178	294175	294173	294171	294169	294167	294166	294164	294162	294160	294159
10	4157	4154	4152	4150	4148	4146	4145	4143	4141	4139	4138
20	4135	4133	4131	4129	4127	4125	4123	4121	4119	4117	4116
30	4114	4111	4109	4107	4105	4103	4102	4100	4098	4096	4195
40	4093	4090	4088	4086	4084	4082	4081	4079	4077	4075	4174
50	4071	4069	4067	4065	4063	4061	4059	4057	4055	4053	4052
57.00	294050	294048	294046	294044	294042	294040	294038	294036	294034	294032	294031
10	4029	4027	4025	4023	4021	4019	4017	4015	4013	4011	4010
20	4008	4005	4003	4001	3999	3997	3995	3993	3991	3989	3988
30	3986	3984	3982	3980	3978	3976	3974	3972	3970	3968	3967
40	3965	3963	3961	3959	3957	3955	3953	3951	3949	3947	3946
50	3944	3941	3939	3937	3935	3933	3931	3929	3927	3925	3924
58.00	293922	293920	293918	293916	293914	293912	293910	293908	293906	293904	293903
10	3901	3899	3897	3895	3893	3891	3889	3887	3885	3883	3882
20	3879	3877	3875	3873	3871	3869	3867	3865	3863	3861	3860
30	3858	3856	3854	3852	3850	3848	3846	3844	3842	3840	3839
40	3837	3835	3833	3831	3829	3827	3825	3823	3821	3819	3818
50	3815	3813	3811	3809	3807	3805	3803	3801	3799	3797	3796
59.00	293794	293792	293790	293788	293786	293784	293782	293780	293778	293776	293775
10	3773	3771	3769	3767	3765	3763	3761	3759	3757	3755	3754
20	3751	3749	3747	3745	3743	3741	3739	3737	3735	3732	3732
30	3730	3728	3726	3724	3722	3720	3718	3716	3714	3712	3711
40	3709	3707	3705	3703	3701	3699	3697	3695	3693	3691	3690
50	3687	3685	3683	3681	3679	3677	3675	3673	3671	3669	3668
60.00	293667	293664	293662	293660	293658	293656	293654	293652	293650	293648	293647
10	3646	3643	3641	3639	3637	3635	3633	3631	3629	3627	3626
20	3625	3622	3620	3618	3615	3613	3611	3609	3607	3606	3604
30	3603	3600	3598	3596	3594	3592	3590	3588	3586	3584	3583
40	3582	3579	3577	3575	3573	3571	3569	3567	3565	3563	3562
50	3561	3558	3556	3554	3551	3549	3547	3545	3543	3542	8540
61.00	293539	293537	293534	293532	293530	293528	293526	293524	293522	293520	293519
10	3518	3516	3513	3511	3509	3507	3505	3503	3501	3499	3498
20	3497	3495	3492	3490	3487	3485	3483	3481	3479	3477	3476
30	3475	3473	3470	3468	3466	3464	3462	3460	3458	3456	3455
40	3454	3452	3449	3447	3445	3443	3441	3439	3437	3435	3434
50	3433	3431	3428	3426	3423	3421	3419	3417	3415	3413	3412

TABLE XXXV.

LUNI SOLAR TABLE,

ing the Angular Distance between the Sun, Moon, and Stars, from the effect of Refraction and Parallax.

Moon's Apparent Altitude.						Moon's Apparent Altitude.					
	86°					87°					
	10′	20′	30′	40′	50′	00′	10′	20′	30′	40′	50′
0	294539	294537	294536	294535	294534	294533	294532	294531	294530	294529	294529
9	4518	4516	4515	4514	4513	4512	4511	4510	4509	4508	4508
7	4496	4494	4493	4492	4491	4490	4489	4488	4487	4486	4486
6	4475	4473	4472	4471	4470	4469	4468	4467	4466	4465	4465
6	4454	4452	4451	4450	4449	4448	4447	1446	4445	4444	4444
4	4432	4430	4429	4428	4427	4426	4425	4424	4423	4422	4422
2	294411	294409	294408	294407	294406	294405	294404	294403	294402	294401	294401
1	4390	4388	4387	4386	4385	4384	4383	4382	4381	4380	4380
9	4368	4366	4365	4364	4363	4362	4361	4360	4359	4358	4358
7	4346	4345	4344	4343	4342	4341	4340	4339	4338	4337	4337
7	4326	4324	4323	4322	4321	4320	4319	4318	4317	4316	4316
5	4304	4302	4301	4300	4299	4298	4297	4297	4296	4295	4295
4	294283	294281	294280	294279	294278	294277	294276	294275	294274	294273	294272
3	4261	4259	4258	4257	4256	4255	4254	4253	4252	4251	4250
2	4240	4238	4237	4236	4235	4234	4233	4232	4231	4230	4229
0	4218	4216	4215	4214	4213	4212	4211	4210	4209	4208	4207
9	4197	4195	4194	4193	4192	4191	4190	4189	4188	4187	4186
7	4175	4173	4172	4171	4171	4169	4168	4167	4166	4165	4164
6	294154	294153	294152	294150	294149	294148	294147	294146	294145	294144	294143
5	4133	4132	4131	4129	4128	4127	4126	4125	4124	4123	4122
3	4111	4110	4109	4107	4106	4105	4104	4103	4102	4101	4100
2	4090	4089	4088	4086	4085	4084	4083	4082	4081	4080	4079
1	4069	4068	4067	4065	4064	4063	4062	4061	4060	4059	4058
9	4047	4046	4045	4043	4042	4041	4040	4039	4038	4037	4036
8	294026	294025	294024	294022	294021	294020	294019	294018	294017	294016	294015
7	4005	4004	4003	4001	4000	3999	3998	3997	3996	3995	3994
5	3983	3982	3982	3979	3978	3977	3976	3975	3974	3973	3972
4	3962	3961	3960	3958	3957	3956	3955	3954	3953	3952	3951
3	3941	3940	3939	3937	3936	3935	3934	3933	3932	3931	3930
21	3919	3918	3917	3915	3914	3913	3912	3911	3910	3909	3908
0	293898	293897	293895	293894	293893	293892	293891	293890	293889	293887	293887
79	3877	3876	3874	3873	3872	3871	3870	3869	3868	3867	3866
7	3855	3854	3852	3851	3850	3849	3848	3847	3846	3845	3844
6	3834	3833	3831	3830	3829	3828	3827	3826	3825	3824	3823
15	3813	3812	3810	3809	3808	3807	3806	3805	3804	3803	3802
3	3791	3790	3788	3787	3786	3785	3784	3783	3782	3781	3780
72	293770	293769	293767	293766	293765	293764	293763	293762	293761	293760	293759
51	3749	3748	3746	3745	3744	3743	3742	3741	3740	3739	3738
29	3727	3726	3724	3723	3722	3721	3720	3719	3718	3717	3716
8	3706	3705	3703	3702	3701	3700	3699	3698	3697	3696	3695
87	3685	3684	3682	3681	3680	3679	3678	3677	3676	3675	3674
55	3663	3662	3660	3659	3658	3657	3656	2655	3654	3653	3652
13	293642	293640	293639	293638	293636	293635	293635	293634	293633	293632	293631
22	3621	3619	3618	3616	3615	3614	3613	3612	3611	3610	3609
0	3599	3597	3596	3595	3594	3593	3592	3591	3590	3589	3588
79	3578	3576	3575	3573	3572	3571	3570	3569	3568	3567	3566
58	3557	3555	3553	3552	3550	3549	3549	3548	3547	3546	3545
36	3535	3534	3532	3530	3529	3528	3527	3526	3525	3524	3523
15	293514	293512	293511	293509	293508	293507	293506	293505	293504	293503	293502
94	3493	3491	3490	3487	3486	3485	3484	3483	3482	3481	3480
72	3471	3469	3468	3466	3465	3464	3463	3462	3461	3460	3459
51	3450	3448	3447	3444	3443	3442	3441	3441	3440	3439	3438
30	3429	3427	3426	3423	3422	3421	3420	3419	3418	3417	3416
8	3407	3405	3404	3401	3400	3399	3398	3397	3396	3395	3394

TABLE XXXV.

LUNI-SOLAR TABLE,

For clearing the Angular Distance between the Sun, Moon, and Stars, from the effect of Refraction and Parallax.

	Moon's Apparent Altitude.						Moon's Appt Alt.		
	88°						89°		
h. p.	00′	10	20′	30	40′	50′	00′	20′	40′
′ ″									
53.00	294528	294527	294527	294526	294525	294524	294524	294523	294523
10	4507	4506	4506	4505	4504	4503	4503	4502	4502
20	4485	4484	4484	4483	4482	4481	4481	4480	4480
30	4464	4463	4463	4462	4460	4460	4460	4459	4459
40	4443	4442	4442	4441	4440	4439	4439	4438	4438
50	4421	4420	4420	4419	4418	4418	4418	4417	4416
54.00	294400	294399	294399	294398	294398	294397	294397	294396	294396
10	4379	4378	4378	4377	4376	4376	4376	4374	4374
20	4357	4356	4356	4355	4354	4354	4354	4352	4352
30	4336	4335	4335	4334	4333	4333	4333	4331	4331
40	4315	4314	4314	4313	4312	4312	4312	4310	4310
50	4294	4293	4293	4292	4291	4291	4291	4289	4288
55.00	294271	294270	294270	294269	294269	294269	294268	291268	294267
10	4249	4248	4248	4247	4247	4247	4246	4246	4245
20	4228	4227	4227	4226	4225	4225	4225	4225	4224
30	4206	4205	4205	4204	4203	4203	4203	4203	4202
40	4185	4184	4184	4183	4182	4181	4182	4182	4181
50	4163	4162	4162	4161	4160	4160	4160	4160	4159
56.00	294143	294142	294142	294141	294141	294140	294140	294139	294139
10	4122	4121	4121	4120	4119	4118	4118	4118	4118
20	4100	4099	4099	4098	4097	4097	4097	4096	4096
30	4079	4078	4078	4077	4076	4076	4076	4075	4075
40	4058	4057	4057	4056	4055	4054	4054	4054	4054
50	4036	4035	4035	4034	4033	4033	4033	4032	4032
57.00	294015	294014	294013	294012	294011	294011	294011	294011	294010
10	3993	3992	3992	3991	3990	3990	3990	3990	3989
20	3972	3971	3971	3970	3969	3968	3968	3968	3967
30	3950	3949	3948	3947	3947	3947	3947	3947	3946
40	3929	3929	3929	3927	3927	3926	3926	3926	3925
50	3908	3908	3907	3906	3906	3905	3904	3904	3903
58.00	293886	293885	293885	293885	293884	293884	293883	293882	293882
10	3865	3864	3864	3864	3863	3863	3861	3860	3860
20	3843	3842	3841	3841	3840	3840	3840	3839	3839
30	3822	3821	3820	3820	3820	3819	3818	3817	3817
40	3801	3800	3799	3799	3798	3798	3797	3796	3796
50	3779	3778	3778	3777	3776	3776	3775	3774	3774
59.00	293758	293757	293756	293756	293755	293755	293755	293754	293753
10	3736	3735	3735	3734	3734	3733	3733	3733	3732
20	3715	3714	3714	3713	3713	3712	3712	3711	3710
30	3694	3793	3693	3692	3692	3691	3691	3690	3689
40	3672	3672	3672	3671	3670	3670	3670	3669	3668
50	3651	3651	3650	3649	3648	3648	3648	3647	3647
60.00	293630	293630	293629	293628	293628	293627	293626	293625	293625
10	3608	3608	3608	3607	3607	3606	3604	3603	3603
20	3587	3586	3586	3585	3585	3584	3583	3582	3582
30	3565	3564	3564	3563	3563	3562	3561	3560	3560
40	3544	3543	3543	3542	3542	3541	3540	3539	3539
50	3523	3522	3522	3521	3521	3520	3519	3518	3517
61.00	293501	293590	293499	293498	293498	293498	293497	293497	293497
10	3480	3479	3478	3477	3477	3476	3475	3475	3475
20	3458	3458	3457	3456	3456	3455	3454	3454	3454
30	3437	3437	3436	3435	3435	3434	3432	3432	3432
40	3416	3415	3414	3414	3413	3413	3411	3411	3411
50	3394	3394	3393	3393	3392	3392	3396	3390	3389

CORRECTIONS TO BE SUBSTRACTED FROM THE FOREGOING LOGS.

Apt. Alt. of ☉ or *	4°	5°	6°	7°	8°	9°	10°	12°	14°	16°	18°	20	22°	24°	26°	28°	30°	32°	34°	36°	38°	40°	45°	50°	55°	60°	65°	70°	75°	80°	85°	90°
Sub. for the ☉'s Alt.	10	14	11	9	8	7	7	6	6	6	7	8	8	9	9	9	10	10	11	11	11	12	13	14	15	16	17	17	18	18	19	19
Sub. for the *'s Alt.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

TABLE XXXVI.

PROPORTIONAL LOGARITHMS.

s. ″	h. m. 0° 0′	h. m. 0° 1′	h. m. 0° 2′	h. m. 0° 3′	h. m. 0° 4′	h. m 0° 5′	h. m. 0° 6′	h. m. 0° 7′	h. m. 0° 8′	s. ″
0		2.2553	1.9542	1.7782	1.6532	1.5563	1.4771	1.4102	1.3522	0
1	4.0334	2.2481	1.9506	1.7757	1.6514	1.5549	1.4759	1.4091	1.3514	1
2	3.7324	2.2410	1.9471	1.7734	1.6496	1.5534	1.4747	1.4081	1.3504	2
3	3.5563	2.2341	1.9435	1.7710	1.6478	1.5520	1.4735	1.4071	1.3495	3
4	3.4314	2.2272	1.9400	1.7686	1.6460	1.5506	1.4723	1.4061	1.3486	4
5	3.3345	2.2205	1.9365	1.7663	1.6443	1.5491	1.4711	1.4050	1.3477	5
6	3.2553	2.2139	1.9331	1.7639	1.6425	1.5477	1.4699	1.4040	1.3468	6
7	3.1883	2.2073	1.9296	1.7616	1.6407	1.5463	1.4688	1.4030	1.3459	7
8	3.1303	2.2009	1.9262	1.7593	1.6390	1.5449	1.4676	1.4020	1.3450	8
9	3.0792	2.1946	1.9228	1.7570	1.6372	1.5435	1.4664	1.4010	1.3441	9
10	3.0334	2.1883	1.9195	1.7547	1.6355	1.5421	1.4652	1.4000	1.3432	10
11	2.9920	2.1822	1.9162	1.7524	1.6338	1.5407	1.4640	1.3989	1.3423	11
12	2.9542	2.1761	1.9128	1.7501	1.6320	1.5393	1.4629	1.3979	1.3415	12
13	2.9195	2.1701	1.9096	1.7479	1.6303	1.5379	1.4617	1.3960	1.3406	13
14	2.8873	2.1642	1.9063	1.7456	1.6286	1.5365	1.4606	1.3959	1.3397	14
15	2.8573	2.1584	1.9031	1.7434	1.6269	1.5351	1.4594	1.3949	1.3388	15
16	2.8293	2.1526	1.8999	1.7412	1.6252	1.5337	1.4582	1.3939	1.3379	16
17	2.8030	2.1469	1.8967	1.7390	1.6235	1.5324	1.4571	1.3929	1.3371	17
18	2.7782	2.1413	1.8935	1.7368	1.6218	1.5310	1.4559	1.3919	1.3362	18
19	2.7547	2.1358	1.8904	1.7346	1.6201	1.5296	1.4548	1.3910	1.3353	19
20	2.7324	2.1303	1.8873	1.7324	1.6185	1.5283	1.4536	1.3900	1.3345	20
21	2.7112	2.1249	1.8842	1.7302	1.6168	1.5269	1.4525	1.3890	1.3336	21
22	2.6910	2.1196	1.8811	1.7281	1.6151	1.5256	1.4514	1.3880	1.3327	22
23	2.6717	2.1143	1.8781	1.7259	1.6135	1.5242	1.4502	1.3870	1.3319	23
24	2.6532	2.1091	1.8751	1.7238	1.6118	1.5229	1.4491	1.3860	1.3301	24
25	2.6355	2.1040	1.8721	1.7217	1.6102	1.5215	1.4480	1.3851	4.3301	25
26	2.6185	2.0989	1.8691	1.7196	1.6085	1.5202	1.4468	1.3841	1.3293	26
27	2.6021	2.0939	1.8661	1.7175	1.6069	1.5189	1.4457	1.3831	1.3284	27
28	2.5863	2.0889	1.8632	1.7154	1.6053	1.5175	1.4446	1.3821	1.3276	28
29	2.5710	2.0840	1.8602	1.7133	1.6037	1.5162	1.4435	1.3812	1.3267	29
30	2.5563	2.0792	1.8573	1.7112	1.6021	1.5149	1.4424	1.3802	1.3259	30
31	2.5421	2.0744	1.8544	1.7091	1.6005	1.5136	1.4412	1.3792	1.3250	31
32	2.5283	2.0696	1.8516	1.7071	1.5989	1.5123	1.4401	1.3783	1.3242	32
33	2.5149	2.0649	1.8487	1.7050	1.5973	1.5110	1.4390	1.3773	1.3233	33
34	2.5019	2.0603	1.8459	1.7030	1.5957	1.5097	1.4379	1.3764	1.3225	34
35	2.4894	2.0557	1.8431	1.7010	1.5941	1.5084	1.4368	1.3754	1.3216	35
36	2.4771	2.0512	1.8403	1.6990	1.5925	1.5071	1.4357	1.3745	1.3208	36
37	2.4652	2.0467	1.8375	1.6970	1.5909	1.5058	1.4346	1.3735	1.3199	37
38	2.4536	2.0422	1.8348	1.6950	1.5894	1.5045	1.4335	1.3726	1.3191	38
39	2.4424	2.0378	1.8320	1.6930	1.5878	1.5032	1.4325	1.3716	1.4183	39
40	2.4314	2.0334	1.8293	1.6910	1.5863	1.5019	1.4314	1.3707	1.3174	40
41	2.4206	2.0291	1.8266	1.6890	1.5847	1.5007	1.4303	1.3697	1.3166	41
42	2.4102	2.0248	1.8239	1.6871	1.5832	1.4994	1.4292	1.3688	1.3158	42
43	2.4000	2.0206	1.8212	1.6851	1.5816	1.4981	1.4281	1.3678	1.3149	43
44	2.3900	2.0164	1.8186	1.6832	1.5801	1.4969	1.4270	1.3669	1.3141	44
45	2.3802	2.0122	1.8159	1.6812	1.5786	1.4956	1.4260	1.3660	1.3133	45
46	2.3707	2.0081	1.8133	1.6793	1.5771	1.4943	1.4249	1.3650	1.3124	46
47	2.3613	2.0040	1.8107	1.6774	1.5755	1.4931	1.4238	1.3641	1.3116	47
48	2.3522	2.0000	1.8081	1.6755	1.5740	1.4918	1.4228	1.3632	1.3108	48
49	2.3432	1.9960	1.8055	1.6736	1.5725	1.4906	1.4217	1.3623	1.3100	49
50	2.3345	1.9920	1.8030	1.6717	1.5710	1.4894	1.4206	1.3613	1.3091	50
51	2.3259	1.9881	1.8004	1.6698	1.5695	1.4881	1.4196	1.3604	1.3083	51
52	2.3174	1.9842	1.7979	1.6679	1.5680	1.4869	1.4185	1.3595	1.3075	52
53	2.3091	1.9803	1.7954	1.6661	1.5666	1.4856	1.4175	1.3586	1.3067	53
54	2.3010	1.9765	1.7929	1.6642	1.5651	1.4844	1.4164	1.3576	1.3059	54
55	2.2931	1.9727	1.7904	1.6624	1.5636	1.4832	1.4154	1.3567	1.3051	55
56	2.2852	1.9690	1.7879	1.6605	1.5621	1.4820	1.4143	1.3558	1.3043	56
57	2.2775	1.9652	1.7855	1.6587	1.5607	1.4808	1.4133	1.3549	1.3034	57
58	2.2700	1.9615	1.7830	1.6568	1.5592	1.4795	1.4122	1.3540	1.3026	58
59	2.2626	1.9579	1.7806	1.6550	1.5578	1.4783	1.4112	1.3531	1.3018	59
60	2.2553	1.9542	1.7782	1.6532	1.5563	1.4771	1.4102	1.3522	1.3010	60

TABLE XXXVI.

PROPORTIONAL LOGARITHMS.

s. ″	h. m. 0° 9′	h. m. 0° 10′	h. m. 0° 11′	h. m. 0° 12′	h. m. 0° 13′	h. m. 0° 14′	h. m. 0° 15′	h. m. 0° 16′	h. m. 0° 17′	s. ″
0	1.3010	1.2553	1.2139	1.1761	1.1413	1.1091	1.0792	1.0512	1.0248	0
1	1.3002	1.2545	1.2132	1.1755	1.1408	1.1086	1.0787	1.0507	1.0244	1
2	1.2994	1.2538	1.2126	1.1749	1.1402	1.1081	1.0782	1.0502	1.0240	2
3	1.2986	1.2531	1.2119	1.1743	1.1397	1.1976	1.0777	1.0498	1.0235	3
4	1.2978	1.2524	1.2113	1.1737	1.1391	1.1071	1.0773	1.0493	1.0231	4
5	1.2970	1.2517	1.2106	1.1731	1.1386	1.1066	1.0768	1.0489	1.0227	5
6	1.2962	1.2510	1.2099	1.1725	1.1380	1.1061	1.0763	1.0484	1.0223	6
7	1.2954	1.2502	1.2093	1.1719	1.1374	1.1055	1.0758	1.0480	1.0219	7
8	1.2946	1.2495	1.2086	1.1713	1.1369	1.1050	1.0753	1.0475	1.0214	8
9	1.2939	1.2488	1.2080	1.1707	1.1363	1.1045	1.0749	1.0471	1.0210	9
10	1.2931	1.2481	1.2073	1.1701	1.1358	1.1040	1.0744	1.0467	1.0206	10
11	1.2923	1.2474	1.2067	1.1695	1.1352	1.1035	1.0739	1.0462	1.0202	11
12	1.2915	1.2467	1.2061	1.1689	1.1347	1.1030	1.0734	1.0458	1.0197	12
13	1.2907	1.2460	1.2054	1.1683	1.1342	1.1025	1.0730	1.0453	1.0193	13
14	1.2899	1.2453	1.2048	1.1677	1.1336	1.1020	1.0725	1.0449	1.0189	14
15	1.2891	1.2445	1.2041	1.1671	1.1331	1.1015	1.0720	1.0444	1.0185	15
16	1.2883	1.2438	1.2035	1.1665	1.1325	1.1009	1.0715	1.0440	1.0181	16
17	1.2876	1.2431	1.2028	1.1660	1.1320	1.1004	1.0711	1.0435	1.0176	17
18	1.2868	1.2424	1.2022	1.1654	1.1314	1.0999	1.0706	1.0431	1.0172	18
19	1.2860	1.2417	1.2016	1.1648	1.1309	1.0994	1.0701	1.0426	1.0168	19
20	1.2852	1.2410	1.2009	1.1642	1.1303	1.0989	1.0696	1.0422	1.0164	20
21	1.2845	1.2403	1.2003	1.1636	1.1298	1.0984	1.0692	1.0418	1.0160	21
22	1.2837	1.2396	1.1996	1.1630	1.1292	1.0979	1.0687	1.0413	1.0156	22
23	1.2829	1.2389	1.1990	1.1624	1.1287	1.0974	1.0682	1.0409	1.0151	23
24	1.2821	1.2382	1.1984	1.1619	1.1282	1.0969	1.0678	1.0404	1.0147	24
25	1.2814	1.2375	1.1977	1.1613	1.1276	1.0964	1.0673	1.0400	1.0143	25
26	1.2806	1.2368	1.1971	1.1607	1.1271	1.0959	1.0668	1.0395	1.0139	26
27	1.2798	1.2362	1.1965	1.1601	1.1266	1.0954	1.0663	1.0391	1.0135	27
28	1.2791	1.2355	1.1958	1.1595	1.1260	1.0949	1.0659	1.0387	1.0131	28
29	1.2783	1.2348	1.1952	1.1589	1.1255	1.0944	1.0654	1.0382	1.0126	29
30	1.2775	1.2341	1.1946	1.1584	1.1249	1.0939	1.0649	1.0378	1.0122	30
31	1.2768	1.2334	1.1939	1.1578	1.1244	1.0934	1.0645	1.0374	1.0118	31
32	1.2760	1.2327	1.1933	1.1572	1.1239	1.0929	1.0640	1.0369	1.0114	32
33	1.2753	1.2320	1.1927	1.1566	1.1233	1.0924	1.0635	1.0365	1.0110	33
34	1.2745	1.2313	1.1921	1.1561	1.1228	1.0919	1.0631	1.0360	1.0106	34
35	1.2738	1.2307	1.1914	1.1555	1.1223	1.0914	1.0626	1.0356	1.0102	35
36	1.2730	1.2300	1.1908	1.1549	1.1217	1.0909	1.0621	1.0352	1.0098	36
37	1.2722	1.2293	1.1902	1.1543	1.1212	1.0904	1.0617	1.0347	1.0093	37
38	1.2715	1.2286	1.1896	1.1538	1.1207	1.0899	1.0612	1.0343	1.0089	38
39	1.2707	1.2279	1.1889	1.1532	1.1201	1.0894	1.0608	1.0339	1.0085	39
40	1.2700	1.2272	1.1883	1.1526	1.1196	1.0889	1.0603	1.0334	1.0081	40
41	1.2692	1.2266	1.1877	1.1520	1.1191	1.0884	1.0598	1.0330	1.0077	41
42	1.2685	1.2259	1.1871	1.1515	1.1186	1.0880	1.0594	1.0326	1.0073	42
43	1.2678	1.2252	1.1865	1.1509	1.1180	1.0875	1.0589	1.0321	1.0069	43
44	1.2670	1.2245	1.1858	1.1503	1.1175	1.0870	1.0585	1.0317	1.0065	44
45	1.2663	1.2239	1.1852	1.1498	1.1170	1.0865	1.0580	1.0313	1.0061	45
46	1.2655	1.2232	1.1846	1.1492	1.1164	1.0860	1.0575	1.0308	1.0057	46
47	1.2648	1.2225	1.1840	1.1486	1.1159	1.0855	1.0571	1.0304	1.0053	47
48	1.2640	1.2218	1.1834	1.1481	1.1154	1.0850	1.0566	1.0300	1.0049	48
49	1.2633	1.2212	1.1828	1.1475	1.1149	1.0845	1.0562	1.0295	1.0044	49
50	1.2626	1.2205	1.1822	1.1469	1.1143	1.0840	1.0557	1.0291	1.0040	50
51	1.2618	1.2198	1.1816	1.1464	1.1138	1.0835	1.0552	1.0287	1.0036	51
52	1.2611	1.2192	1.1809	1.1458	1.1133	1.0831	1.0548	1.0282	1.0032	52
53	1.2604	1.2185	1.1803	1.1452	1.1128	1.0826	1.0543	1.0278	1.0028	53
54	1.2596	1.2178	1.1797	1.1447	1.1123	1.0821	1.0539	1.0274	1.0024	54
55	1.2589	1.2172	1.1791	1.1441	1.1117	1.0816	1.0534	1.0270	1.0020	55
56	1.2582	1.2165	1.1785	1.1436	1.1112	1.0811	1.0530	1.0265	1.0016	56
57	1.2574	1.2159	1.1779	1.1430	1.1107	1.0806	1.0525	1.0261	1.0012	57
58	1.2567	1.2152	1.1773	1.1424	1.1102	1.0801	1.0521	1.0257	1.0008	58
59	1.2560	1.2145	1.1767	1.1419	1.1097	1.0797	1.0516	1.0252	1.0004	59
60	1.2553	1.2139	1.1761	1.1413	1.1091	1.0792	1.0512	1.0248	1.0000	60

TABLE XXXVI.

PROPORTIONAL LOGARITHMS.

s. ″	h. m. 0° 18′	h. m. 0° 19′	h. m. 0° 20′	h. m. 0° 21′	h. m. 0° 22′	h. m. 0° 23′	h. m. 0° 24′	h. m. 0° 25′	h. m. 0° 26′	h. m. 0° 27′	h. m. 0° 28′	h. m. 0° 29	s. ″
0	10000	9765	9542	9331	9128	8935	8751	8573	8403	8239	8081	7929	0
1	9996	9761	9539	9327	9125	8932	8748	8570	8400	8236	8079	7926	1
2	9992	0758	9535	9324	9122	8929	8745	8568	8397	8234	8076	7924	2
3	9988	9754	9532	9320	9119	8926	8742	8565	8395	8231	8073	7921	3
4	9984	9750	9528	9317	9115	8923	8739	8562	8392	8228	8071	7919	4
5	9980	9746	9524	9313	9112	8920	8736	8559	8389	8226	8068	7916	5
6	9976	9742	9521	9310	9109	8917	8733	8556	8386	8223	8066	7914	6
7	9972	9739	9517	9306	9106	8913	8730	8553	8384	8220	8063	7911	7
8	9968	9735	9514	9303	9103	8910	8727	8550	8381	8218	8061	7909	8
9	9964	9731	9510	9300	9099	8907	8724	8547	8378	8215	8058	7906	9
10	9960	9727	9506	9296	9096	8904	8721	8544	8375	8212	8055	7904	10
11	9956	9723	9503	9293	9092	8901	8718	8542	8372	8210	8053	7901	11
12	9952	9720	9499	9289	9089	8898	8715	8539	8370	8207	8050	7899	12
13	9948	9716	9496	9286	9086	8895	8712	8536	8367	8204	8048	7896	13
14	9944	9712	9492	9283	9083	8892	8709	8533	8364	8202	8045	7894	14
15	9940	9708	9488	9279	9079	8888	8706	8530	8361	8199	8043	7891	15
16	9936	9705	9485	9276	9076	8885	8703	8527	8359	8196	8040	7889	16
17	9032	9701	9481	9272	9073	8882	8700	8524	8356	8194	8037	7887	17
18	9928	9697	9478	9269	9070	8879	8697	8522	8353	8191	8035	7884	18
19	9924	9693	9474	9266	9066	8876	8694	8519	8350	8188	8032	7882	19
20	9920	9690	9471	9262	9063	8873	8691	8516	8348	8186	8030	7879	20
21	9916	9686	9467	9259	9060	8870	8688	8513	8345	8183	8027	7877	21
22	9912	9682	9464	9255	9057	8867	8685	8510	8342	8181	8025	7874	22
23	9908	9678	9460	9252	9053	8864	3682	8507	8339	8178	8022	7872	23
24	9905	9675	9456	9249	9050	8861	8679	8504	8337	8175	8020	7869	24
25	9901	9671	9453	9245	9047	8857	8676	8502	8334	8173	8017	7867	25
26	9897	9667	9449	9242	9044	8854	8673	8499	8331	8170	8014	7864	26
27	9893	9664	9446	9238	9041	8851	8670	8496	8328	8167	8012	7862	27
28	9889	9660	9442	9235	9037	8848	8667	8493	8326	8165	8009	7859	28
29	9885	9656	9439	9232	9034	8845	8664	8490	8323	8162	8007	7857	29
30	9881	9652	9435	9228	9031	8842	8661	8487	8320	8159	8004	7855	30
31	9877	9649	9432	9225	9028	8839	8658	8484	8318	8157	8002	7852	31
32	9873	9645	9428	9222	9024	8836	8655	8482	8315	8154	7999	7850	32
33	9869	9641	9425	9218	9021	8833	8652	8479	8312	8152	7997	7847	33
34	9865	9638	9421	9215	9018	8830	8649	8476	8309	8149	7991	7845	34
35	9861	9634	9418	9212	9015	8827	8646	8473	8307	8146	7992	7842	35
36	9858	9630	9414	9208	9012	8824	8643	8470	8304	8144	7989	7840	36
37	9854	9626	9411	9205	9008	8821	8640	8467	8301	8141	7987	7837	37
38	9850	9623	9407	9201	9005	8817	8637	8465	8298	8138	7984	7835	38
39	9846	9619	9404	9198	9002	8814	8635	8462	8296	8136	7981	7832	39
40	9842	9615	9400	9195	8999	8811	8632	8459	8293	8133	7979	7830	40
41	9938	9612	9397	9191	8996	8808	8629	8456	8200	8131	7976	7828	41
42	9834	9608	9393	9188	8992	8805	8626	8453	8288	8128	7974	7825	42
43	9830	9604	9390	9185	8989	8802	8623	8451	8285	8125	7971	7823	43
44	9827	9601	9386	9181	8986	8799	8620	8448	8282	8123	7969	7820	44
45	9823	9597	9383	9178	8983	8796	8617	8445	8279	8120	7966	7818	45
46	9819	9593	9379	9175	8980	8793	8614	8442	8277	8117	7964	7815	46
47	9815	9590	9376	9172	8977	8790	8612	8439	8274	8115	7961	7813	47
48	9811	9586	9372	9168	8973	8787	8608	8437	8271	8112	7959	7811	48
49	9807	9582	9369	9165	8970	8784	8605	8434	8269	8110	7956	7808	49
50	9803	9579	9365	9162	8967	8781	8602	8431	8266	8107	7954	7806	50
51	9800	9575	9362	9158	8964	8778	8599	8428	8263	8104	7951	7803	51
52	9796	9571	9358	9155	8961	8775	8597	8425	8261	8102	7949	7801	52
53	9792	9568	9355	9152	8958	8772	8594	8423	8258	8099	7946	7798	53
54	9788	8564	9351	9148	8954	8769	8591	8420	8255	8097	7944	7796	54
55	9784	9561	9348	8145	8951	8766	8588	8417	8253	8094	7941	7794	55
56	9780	9557	9344	9142	8948	8763	8585	8414	8250	8091	7939	7791	56
57	9777	9553	9341	9138	8945	8760	8582	8411	8247	8089	7936	7789	57
58	9773	9550	9337	9135	8942	8757	8579	8409	8244	8086	7934	7786	58
59	9769	9546	9334	9132	8939	8754	8576	8406	8242	8084	7931	7784	59
60	9765	9542	9331	9128	8935	8751	8573	8403	8239	8081	7929	7782	60

PROPORTIONAL LOGARITHMS.

s. ″	h. m. 0° 30′	h. m. 0° 31′	h. m. 0° 32′	h. m. 0° 33′	h. m. 0° 34′	h. m. 0° 35′	h. m. 0° 36′	h. m. 0° 37′	h. m. 0° 38′	h. m. 0° 39′	h. m. 0° 40′	h. m. 0° 41′	s. ″
0	7782	7639	7501	7368	7238	7112	6990	6871	6755	6642	6532	6425	0
1	7779	7637	7499	7365	7236	7110	6988	6869	6753	6640	6530	6423	1
2	7777	7634	7497	7363	7234	7108	6986	6867	6751	6638	6529	6421	2
3	7774	7632	7494	7361	7232	7106	6984	6865	6749	6637	6527	6420	3
4	7772	7630	7492	7359	7229	7104	6982	6863	6747	6635	6525	6418	4
5	7769	7627	7490	7357	7227	7102	6980	6861	6745	6633	6523	6416	5
6	7767	7625	7488	7354	7225	7100	6978	6859	6743	6631	6521	6414	6
7	7765	7623	7485	7352	7223	7098	6976	6857	6742	6629	6519	6413	7
8	7762	7620	7483	7350	7221	7096	6974	6855	6740	6627	6518	6411	8
9	7760	7618	7481	7348	7219	7093	6972	6853	6738	6625	6516	6409	9
10	7757	7616	7479	7346	7217	7091	6970	6851	6736	6624	6514	6407	10
11	7755	7613	7476	7344	7215	7089	6968	6849	6734	6622	6512	6406	11
12	7753	7611	7474	7341	7212	7087	6966	6847	6732	6620	6510	6404	12
13	7750	7609	7472	7339	7210	7085	6964	6845	6730	6618	6509	6402	13
14	7748	7607	7470	7337	7208	7083	6962	6843	6728	6616	6507	6400	14
15	7745	7604	7467	7335	7206	7081	6960	6841	6726	6614	6505	6398	15
16	7743	7602	7465	7333	7204	7079	6978	6840	6725	6612	6503	·6397	16
17	7741	7600	7463	7330	7202	7077	6956	6838	6723	6611	6901	6395	17
18	7738	7597	7461	7328	7200	7075	6954	6836	6721	6609	6500	6393	18
19	7736	7595	7458	7326	7198	7073	6952	6834	6719	6607	6498	6391	19
20	7734	7593	7456	7324	7196	7071	6950	6832	6717	6605	6496	6390	20
21	7731	7590	7454	7322	7193	7069	6948	6830	6715	6603	6494	6388	21
22	7729	7588	7452	7320	7191	7067	6946	6828	6713	6601	6492	6386	22
23	7726	7586	7450	7317	7189	7065	6944	6826	6711	6600	6491	6384	23
24	7724	7583	7447	7315	7187	7063	6942	6824	6709	6598	6489	6383	24
25	7722	7581	7445	7313	7185	7061	6940	6822	6708	6596	6487	6381	25
26	7719	7579	7443	7311	7183	7059	6938	6820	6706	6594	6485	6379	26
27	7717	7577	7441	7309	7181	7057	6936	6818	6704	6592	6484	6377	27
28	7714	7574	7438	7307	7179	7055	6934	6816	6702	6590	6482	6376	28
29	7712	7572	7436	7304	7177	7052	6932	6814	6700	6589	6480	6374	29
30	7710	7570	7434	7302	7175	7050	6930	6812	6698	6587	6478	6372	30
31	7707	7567	7432	7300	7172	7048	6928	6810	6696	6585	6476	6371	31
32	7705	7565	7429	7298	7170	7046	6926	6809	6694	6583	6475	6369	32
33	7703	7563	7427	7296	7168	7044	6924	6807	6692	6581	6473	6367	33
34	7700	7560	7425	7294	7166	7042	6922	6805	6691	6579	6471	6365	34
35	7698	7558	7433	7291	7164	7040	6920	6803	6689	6578	6469	6364	35
36	7696	7556	7421	7289	7162	7038	6918	6801	6687	6576	6467	6362	36
37	7693	7554	7418	7287	7160	7036	6916	6799	6685	6574	6466	6360	37
38	7691	7551	7416	7285	7158	7034	6914	6797	6683	6572	6464	6358	38
39	7688	7549	7414	7283	7156	7032	6912	6795	6681	6570	6462	6357	39
40	7686	7547	7412	7281	7154	7030	6910	6793	6679	6568	6460	6355	40
41	7684	7544	7409	7279	7152	7028	6908	6791	6677	6567	6459	6353	41
42	7681	7542	7407	7276	7149	7026	6906	6789	6676	6565	6457	6351	42
43	7679	7540	7405	7274	7147	7024	6904	6787	6674	6563	6455	6350	43
44	7677	7538	7403	7272	7145	7022	6902	6785	6672	6561	6453	6348	44
45	7674	7535	7401	7270	7143	7020	6900	6784	6670	6559	6451	6346	45
46	7672	7533	7398	7268	7141	7018	6898	6782	6668	6558	6450	6344	46
47	7670	7531	7396	7266	7139	7016	6896	6780	6666	6556	6448	6343	47
48	7667	7528	7394	7264	7137	7014	6894	6778	6664	6554	6446	6341	48
49	7665	7526	7392	7261	7135	7012	6892	6776	6663	6552	6444	6339	49
50	7663	7524	7390	7259	7133	7010	6890	6774	6661	6550	6443	6338	50
51	7660	7522	7387	7257	7131	7008	6888	6772	6659	6548	6441	6336	51
52	7658	7519	7385	7255	7129	7006	6886	6770	6657	6547	6439	6334	52
53	7655	7517	7383	7253	7127	7004	6884	6768	6655	6545	6437	6332	53
54	7653	7515	7381	7251	7124	7002	6882	6766	6653	6543	6435	6331	54
55	7651	7513	7379	7249	7122	7000	6881	6764	6651	6541	6434	6329	55
56	7648	7510	7376	7246	7120	6998	6879	6763	6650	6539	6432	6327	56
57	7646	7508	7374	7244	7118	6996	6877	8761	6648	6538	6430	6325	57
58	7644	7506	7372	7242	7116	6994	6875	6759	6646	6536	6428	6324	58
59	7641	7503	7370	7240	7114	6992	6873	6757	6644	6534	6427	6322	59
60	7639	7501	7368	7238	7112	6990	6871	6755	6642	6532	6425	6320	60

TABLE XXXVI.

PROPORTIONAL LOGARITHMS.

s. ″	h. m. 0° 42′	h. m. 0° 43′	h. m. 0° 44′	h. m. 0° 45′	h. m. 0° 46′	h. m. 0° 47′	h. m. 0° 48′	h. m. 0° 49′	h. m. 0° 50′	h. m. 0° 51′	h. m. 0° 52′	h. m. 0° 53′	s. ″
0	6320	6218	6118	6021	5925	5832	5740	5651	5563	5477	5393	5310	0
1	6319	6216	6117	6019	5924	5830	5739	5649	5562	5476	5391	5309	1
2	6317	6215	6115	6017	5922	5829	5737	5648	5560	5474	5390	5307	2
3	6315	6213	6113	6016	5920	5827	5736	5646	5559	5473	5389	5306	3
4	6313	6211	6112	6014	5919	5826	5734	5645	5557	5471	5387	5305	4
5	6312	6210	6110	6013	5917	5824	5733	5643	5556	5470	5386	5303	5
6	6310	6208	6108	6011	5916	5823	5731	5642	5554	5469	5384	5302	6
7	6308	6206	6107	6009	5914	5821	5730	5640	5553	5467	5383	5300	7
8	6306	6205	6105	6008	5913	5819	5728	5639	5551	5466	5382	5299	8
9	6305	6203	6103	6006	5911	5818	5727	5637	5550	5464	5380	5298	9
10	6303	6201	6102	6005	5909	5816	5725	5636	5549	5463	5379	5296	10
11	6301	6200	6100	6003	5908	5815	5724	5635	5547	5461	5377	5295	11
12	6300	6198	6099	6001	5906	5813	5722	5633	5546	5460	5376	5294	12
13	6298	6196	6097	6000	5905	5812	5721	5632	5544	5459	5375	5292	13
14	6296	6195	6095	5998	5903	5810	5719	5630	5543	5457	5373	5291	14
15	6294	6193	6094	5997	5902	5809	5718	5629	5541	5456	5372	5290	15
16	6293	6191	6092	5995	5900	5807	5716	5627	5540	5454	5370	5288	16
17	6291	6190	6090	5993	5898	5806	5715	5626	5538	5453	5369	5287	17
18	6289	6188	6089	5992	5897	5804	5713	5624	5537	5452	5368	5285	18
19	6288	6186	6087	5990	5895	5803	5712	5623	5536	5450	5366	5284	19
20	6286	6185	6085	5989	5894	5801	5710	5621	5534	5449	5365	5283	20
21	6284	6183	6084	5987	5892	5800	5709	5620	5533	5447	5364	5281	21
22	6282	6181	6082	5985	5891	5798	5707	5618	5531	5446	5362	5280	22
23	6281	6179	6081	5984	5889	5796	5706	5617	5530	5445	5361	5279	23
24	6279	6178	6079	5982	5888	5795	5704	5615	5528	5443	5359	5277	24
25	6277	6176	6077	5981	5886	5793	5703	5614	5527	5442	5358	5276	25
26	6276	6174	6076	5979	5884	5792	5701	5613	5526	5440	5357	5275	26
27	6274	6173	6074	5977	5883	5790	5700	5611	5524	5439	5355	5273	27
28	6272	6171	6072	5976	5881	5789	5698	5610	5522	5437	5354	5272	28
29	6271	6169	6071	5974	5880	5787	5697	5608	5521	5436	5353	5271	29
30	6269	6168	6069	5973	5878	5786	5695	5607	5520	5435	5351	5269	30
31	6267	6166	6067	5971	5877	5784	5694	5605	5518	5433	5350	5268	31
32	6265	6165	6066	5969	5875	5783	5692	5604	5517	5432	5348	5266	32
33	6264	6163	6064	5968	5874	5781	5691	5602	5516	5430	5347	5265	33
34	6262	6161	6063	5966	5872	5780	5689	5601	5514	5429	5346	5264	34
35	6260	6160	6061	5965	5870	5778	5688	5599	5513	5428	5344	5262	35
36	6259	6158	6059	5963	5869	5777	5686	5598	5511	5426	5343	5261	36
37	6257	6156	6058	5961	5867	5775	5685	5596	5510	5425	5341	5260	37
38	6255	6155	6056	5960	5866	5774	5683	5595	5508	5423	5340	5258	38
39	6254	6153	6055	5958	5864	5772	5682	5594	5507	5422	5339	5257	39
40	6252	6151	6053	5957	5863	5771	5680	5592	5506	5421	5337	5256	40
41	6250	6150	6051	5955	5861	5769	5679	5591	5504	5419	5336	5254	41
42	6248	6148	6050	5954	5860	5768	5677	5589	5503	5418	5335	5253	42
43	6247	6146	6048	5952	5858	5766	5676	5588	5501	5416	5333	5252	43
44	6245	6145	6046	5950	5856	5765	5674	5586	5500	5415	5332	5250	44
45	6243	6143	6045	5949	5855	5763	5673	5585	5498	5414	5331	5249	45
46	6242	6141	6043	5947	5853	5761	5671	5583	5497	5412	5329	5248	46
47	6240	6140	6042	5946	5852	5760	5670	5582	5496	5411	5328	5246	47
48	6238	6138	6040	5944	5850	5758	5669	5580	5494	5409	5326	5245	48
49	6237	6136	6038	5942	5849	5757	5667	5579	5493	5408	5325	5244	49
50	6235	6135	6037	5941	5847	5755	5666	5578	5491	5407	5324	5242	50
51	6233	6133	6035	5939	5846	5754	5664	5576	5490	5405	5322	5241	51
52	6232	6131	6033	5938	5844	5752	5663	5575	5488	5404	5321	5240	52
53	6230	6130	6032	5936	5843	5751	5661	5573	5487	5402	5320	5238	53
54	6228	6128	6030	5935	5841	5749	5660	5572	5486	5401	5318	5237	54
55	6226	6126	6029	5933	5839	5748	5658	5570	5484	5400	5317	5235	55
56	6225	6125	6027	5931	5838	5746	5657	5569	5483	5398	5315	5234	56
57	6223	6123	6025	5930	5836	5745	5655	5567	5481	5397	5314	5233	57
58	6221	6121	6024	5928	5835	5743	5654	5566	5480	5395	5313	5231	58
59	6220	6120	6022	5927	5833	5742	5652	5564	5478	5394	5311	5230	59
60	6218	6118	6021	5925	5832	5740	5651	5563	5477	5393	5310	5229	60

TABLE XXXVI.

PROPORTIONAL LOGARITHMS.

s. ″	h. m. 0° 54′	h. m. 0° 55′	h. m. 0° 56′	h. m. 0° 57′	h. m 0° 58′	h. m 0° 59′	h. m. 1° 0′	h. m. 1° 1′	h. m. 1° 2′	h. m. 1° 3	h. m. 1° 4′	h. m. 1° 5′	s. ″
0	5229	5149	5071	4994	4918	4844	4771	4699	4629	4559	4491	4424	0
1	5227	5148	5070	4993	4917	4843	4770	4698	4628	4558	4490	4422	1
2	5226	5146	5068	4991	4916	4842	4769	4697	4626	4557	4489	4421	2
3	5225	5145	5067	4990	4915	4841	4768	4696	4625	4556	4488	4420	3
4	5223	5144	5066	4989	4913	4839	4766	4695	4624	4555	4486	4419	4
5	5222	5143	5064	4988	4912	4838	4765	4693	4623	4554	4485	4418	5
6	5221	5141	5063	4986	4911	4837	4764	4692	4622	4552	4484	4417	6
7	5219	5140	5062	4985	4910	4836	4763	4691	4621	4551	4483	4416	7
8	5218	5139	5061	4984	4908	4834	4762	4690	4619	4550	4482	4415	8
9	5217	5137	5059	4983	4907	4833	4760	4689	4618	4549	4481	4414	9
10	5215	5136	5058	4981	4906	4832	4759	4688	4617	4548	4480	4412	10
11	5214	5135	5057	4980	4905	4831	4758	4686	4616	4547	4479	4411	11
12	5213	5133	5055	4979	4903	4830	4757	4685	4615	4546	4477	4410	12
13	5211	5132	5054	4977	4902	4828	4756	4684	4614	4544	4476	4409	13
14	5210	5131	5053	4976	4901	4827	4754	4683	4612	4543	4475	4408	14
15	5209	5129	5051	4975	4900	4826	4753	4682	4611	4542	4474	4407	15
16	5207	5128	5050	4974	4899	4825	4752	4680	4610	4541	4473	4406	16
17	5206	5127	5049	4972	4897	4823	4751	4679	4609	4540	4472	4405	17
18	5205	5125	5048	4971	4896	4822	4750	4678	4608	4539	4471	4404	18
19	5203	5124	5046	4970	4895	4821	4748	4677	4607	4538	4469	4402	19
20	5202	5123	5045	4969	4894	4820	4747	4676	4606	4536	4468	4401	20
21	5201	5122	5044	4967	4892	4819	4746	4675	4604	4535	4467	4400	21
22	5199	5120	5043	4966	4891	4817	4745	4673	4603	4534	4466	4399	22
23	5198	5119	5041	4965	4890	4816	4744	4672	4602	4533	4465	4398	23
24	5197	5118	5040	4964	4889	4815	4742	4671	4601	4532	4464	4397	24
25	5195	5116	5039	4962	4887	4814	4741	4670	4600	4531	4463	4396	25
26	5194	5115	5037	4961	4886	4812	4740	4669	4599	4530	4462	4395	26
27	5193	5114	5036	4960	4885	4811	4739	4668	4597	4528	4460	4394	27
28	5191	5112	5035	4959	4884	4810	4738	4666	4596	4527	4459	4393	28
29	5190	5111	5034	4957	4882	4809	4736	4665	4595	4526	4458	4391	29
30	5189	5110	5032	4956	4881	4808	4735	4664	4594	4525	4457	4390	30
31	5187	5108	5031	4955	4880	4806	4734	4663	4593	4524	4456	4389	31
32	5186	5107	5030	4954	4879	4805	4733	4662	4592	4523	4455	4388	32
33	5185	5106	5028	4952	4877	4804	4732	4660	4590	4522	4454	4387	33
34	5183	5105	5027	4951	4876	4803	4730	4659	4589	4520	4453	4386	34
35	5182	5103	5026	4950	4875	4801	4729	4658	4588	4519	4452	4385	35
36	5181	5102	5025	4949	4874	4800	4728	4657	4587	4518	4450	4384	36
37	5179	5101	5023	4947	4873	4799	4727	4656	4586	4517	4449	4383	37
38	5178	5099	5022	4946	4871	4798	4726	4655	4585	4516	4448	4381	38
39	5177	5098	5021	4945	4870	4797	4724	4653	4584	4515	4447	4380	39
40	5175	5097	5019	4943	4869	4795	4723	4652	4582	4514	4446	4379	40
41	5174	5095	5018	4942	4868	4794	4722	4651	4581	4512	4445	4378	41
42	5173	5094	5017	4941	4866	4793	4721	4650	4580	4511	4444	4377	42
43	5172	5093	5016	4940	4865	4792	4720	4649	4579	4510	4443	4376	43
44	5170	5092	5014	4938	4864	4791	4718	4648	4578	4509	4441	4375	44
45	5169	5090	5013	4937	4863	4789	4717	4646	4577	4508	4440	4374	45
46	5168	5089	5012	4936	4861	4788	4716	4645	4575	4507	4439	4373	46
47	5166	5088	5011	4935	4860	4787	4715	4644	4574	4506	4438	4372	47
48	5165	5086	5009	4933	4859	4786	4714	4643	4573	4505	4437	4370	48
49	5164	5085	5008	4932	4858	4785	4712	4642	4572	4503	4436	4369	49
50	5162	5084	5007	4931	4856	4783	4711	4640	4571	4502	4435	4368	50
51	5161	5082	5005	4930	4855	4782	4710	4639	4570	4501	4434	4367	51
52	5160	5081	5004	4928	4854	4781	4709	4638	4569	4500	4433	4366	52
53	5158	5080	5003	4927	4853	4780	4708	4637	4567	4499	4431	4365	53
54	5157	5079	5002	4926	4852	4778	4707	4636	4566	4498	4430	4364	54
55	5156	5077	5000	4925	4850	4777	4705	4635	4565	4497	4429	4363	55
56	5154	5076	4999	4923	4849	4776	4704	4633	4564	4495	4428	4362	56
57	5153	5075	4998	4922	4848	4775	4703	4632	4563	4494	4427	4361	57
58	5152	5073	4997	4921	4847	4774	4702	4631	4562	4493	4426	4359	58
59	5150	5072	4995	4920	4845	4772	4701	4630	4560	4492	4425	4358	59
60	5149	5071	4994	4918	4844	4771	4699	4629	4559	4491	4424	4357	60

TABLE XXXVI.

PROPORTIONAL LOGARITHMS.

s. ″	h. m. 1° 6′	h. m. 1° 7′	h. m. 1° 8′	h. m. 1° 9′	h. m 1° 10′	h. m. 1° 11′	h. m. 1° 12′	h. m. 1° 13′	h. m. 1° 14′	h. m. 1° 15′	h. m. 1° 16′	h. m. 1° 17′	s. ″
0	4357	4292	4228	4164	4102	4040	3979	3919	3860	3802	3745	3688	0
1	4356	4291	4227	4163	4101	4039	3978	3919	3859	3801	3744	3687	1
2	4355	4290	4226	4162	4100	4038	3977	3918	3858	3800	3743	3686	2
3	4354	4289	4224	4161	4099	4037	3976	3917	3858	3799	3742	3685	3
4	4353	4288	4223	4160	4098	4036	3975	3916	3856	3798	3741	3684	4
5	4352	4287	4222	4159	4097	4035	3974	3915	3856	3797	3740	3683	5
6	4351	4285	4221	4158	4096	4034	3973	3914	3855	3796	3739	3682	6
7	4350	4284	4220	4157	4095	4033	3972	3913	3854	3795	3738	3681	7
8	4349	4283	4219	4156	4093	4032	3971	3912	3853	3794	3737	3680	8
9	4347	4282	4218	4155	4092	4031	3970	3911	3852	3793	3736	3679	9
10	4346	4281	4217	4154	4091	4030	3969	3910	3851	3792	3735	3678	10
11	4345	4280	4216	4153	4090	4029	3968	3909	3850	3792	3734	3677	11
12	4344	4279	4215	4152	4089	4028	3967	3908	3849	3791	3733	3677	12
13	4343	4278	4214	4151	4088	4027	3966	3907	3848	3790	3732	3676	13
14	4342	4277	4213	4150	4087	4026	3965	3906	3847	3789	3731	3675	14
15	4341	4276	4212	4149	4086	4025	3964	3905	3846	3788	3730	3674	15
16	4340	4275	4211	4147	4085	4024	3963	3904	3845	3787	3729	3673	16
17	4339	4274	4210	4146	4084	4023	3962	3903	3844	3786	3728	3672	17
18	4338	4273	4209	4145	4083	4022	3961	3902	3843	3785	3727	3671	18
19	4336	4271	4207	4144	4082	4021	3960	3901	3842	3784	3727	3670	19
20	4335	4270	4206	4143	4081	4020	3959	3900	3841	3783	3726	3669	20
21	4334	4269	4205	4142	4080	4019	3958	3899	3840	3782	3725	3668	21
22	4333	4268	4204	4141	4079	4018	3957	3898	3839	3781	3724	3667	22
23	4332	4267	4203	4140	4078	4017	3956	3897	3838	3780	3723	3666	23
24	4331	4266	4202	4139	4077	4016	3955	3896	3832	3779	3722	3665	24
25	4330	4265	4201	4138	4076	4015	3954	3895	3836	3778	3721	3664	25
26	4329	4264	4200	4137	4075	4014	3953	3894	3835	3777	3720	3663	26
27	4328	4263	4199	4136	4074	4013	3952	3893	3834	3776	3719	3663	27
28	4327	4262	4198	4135	4073	4012	3951	3892	3833	3775	3718	3662	28
29	4326	4261	4197	4134	4072	4011	3950	3891	3832	3774	3717	3661	29
30	4325	4260	4196	4133	4071	4010	3949	3890	3831	3773	3716	3660	30
31	4323	4259	4195	4132	4070	4009	3948	3889	3830	3772	3715	3659	31
32	4322	4258	4194	4131	4069	4008	3947	3888	3829	3771	3714	3658	32
33	4321	4256	4193	4130	4068	4007	3946	3887	3828	3770	3713	3657	33
34	4320	4255	4192	4129	4067	4006	3945	3886	3827	3769	3712	3656	34
35	4319	4254	4191	4128	4066	4005	3944	3885	3826	3768	3711	3655	35
36	4318	4253	4189	4127	4065	4004	3943	3884	3825	3768	3710	3654	36
37	4317	4252	4188	4126	4064	4003	3942	3883	3824	3767	3709	3653	37
38	4316	4251	4187	4125	4063	4002	3941	3882	3823	3766	3709	3652	38
39	4315	4250	4186	4124	4062	4001	3940	3881	3822	3765	3708	3651	39
40	4314	4249	4185	4122	4061	4000	3939	3880	3821	3764	3707	3650	40
41	4313	4248	4184	4121	4060	3999	3938	3879	3820	3763	3706	3649	41
42	4311	4247	4183	4120	4059	3998	3937	3878	3820	3762	3705	3649	42
43	4310	4246	4182	4119	4058	3997	3936	3877	3819	3761	3704	3648	43
44	4309	4245	4181	4118	4056	3996	3935	3876	3818	3760	3703	3647	44
45	4308	4244	4180	4117	4055	3995	3934	3875	3817	3759	3702	3646	45
46	4307	4243	4179	4116	4054	3993	3933	3874	3816	3758	3701	3645	46
47	4306	4241	4178	4115	4053	3992	3932	3873	3815	3757	3700	3644	47
48	4305	4240	4177	4114	4052	3991	3931	3872	3814	3756	3699	3643	48
49	4304	4239	4176	4113	4051	3990	3930	3871	3813	3755	3698	3642	49
50	4303	4238	4175	4112	4050	3989	3929	3870	3812	3754	3697	3641	50
51	4302	4237	4174	4111	4049	3988	3928	3869	3811	3753	3696	3640	51
52	4301	4236	4173	4110	4048	3987	3927	3868	3810	3552	3695	3639	52
53	4300	4235	4172	4109	4047	3986	3926	3867	3809	3751	3694	3638	53
54	4298	4234	4171	4108	4046	3985	3925	3866	3808	3750	3693	3637	54
55	4297	4233	4169	4107	4045	3984	3924	3865	3807	3749	3693	3636	55
56	4296	4232	4168	4106	4044	3983	3923	3864	3806	3748	3692	3635	56
57	4295	4231	4167	4105	4043	3982	3922	3863	3805	3747	3691	3635	57
58	4294	4230	4166	4104	4042	3981	3921	3862	3804	3746	3690	3634	58
59	4293	4229	4165	4103	4041	3980	3920	3861	3803	3746	3689	3633	59
60	4292	4228	4164	4102	4040	3979	3919	3860	3802	3745	3688	3632	60

TABLE XXXVI.

PROPORTIONAL LOGARITHMS.

s. ″	h. m 1° 18′	h. m. 1° 19′	h. m. 1° 20′	h. m. 1° 21′	h. m. 1° 22′	h. m. 1° 23	h. m. 1° 24′	h. m. 1° 25′	h. m. 1° 26′	h. m. 1° 27	h. m. 1° 28	h. m. 1° 29	s. ″
0	3632	3576	3522	3468	3415	3362	3310	3259	3208	3158	3108	3059	0
1	3631	3576	3521	3467	3414	3361	3309	3258	3207	3157	3107	3058	1
2	3630	3575	3520	3466	3413	3360	3308	3257	3206	3156	3106	3057	2
3	3629	3574	3519	3465	3412	3359	3307	3256	3205	3155	3105	3056	3
4	3628	3573	3518	3464	3411	3358	3306	3255	3204	3154	3105	3056	4
5	3627	3572	3517	3463	3410	3358	3306	3254	3204	3153	3104	3055	5
6	3626	3571	3516	3463	3409	3357	3305	3253	3203	3153	3103	3054	6
7	3625	3570	3515	3462	3408	3356	3304	3253	3202	3152	3102	3053	7
8	3624	3569	3514	3461	3408	3355	3303	3252	3201	3151	3101	3052	8
9	3623	3568	3514	3460	3407	3354	3302	3251	3200	3150	3101	3052	9
10	3623	3567	3513	3459	3406	3353	3301	3250	3199	3149	3100	3051	10
11	3622	3566	3512	3458	3405	3352	3300	3249	3198	3148	3099	3050	11
12	3621	3565	3511	3457	3404	3351	3300	3248	3198	3148	3098	3049	12
13	3620	3565	3510	3456	3403	3351	3299	3247	3197	3147	3097	3048	13
14	3619	3564	3509	3455	3402	3350	3298	3247	3196	3146	3096	3047	14
15	3618	3563	3508	3454	3401	3349	3297	3246	3195	3145	3096	3047	15
16	3617	3562	3507	3454	3400	3348	3296	3245	3194	3144	3095	3046	16
17	3616	3561	3506	3453	3400	3347	3295	3244	3193	3143	3094	3045	17
18	3615	3560	3506	3452	3399	3346	3294	3243	3193	3143	3093	3044	18
19	3614	3559	3505	3451	3398	3345	3294	3242	3192	3142	3092	3043	19
20	3613	3558	3504	3450	3397	3345	3293	3242	3191	3141	3091	3043	20
21	3612	3557	3503	3449	3396	3344	3292	3241	3190	3140	3091	3042	21
22	3611	3556	3502	3448	3395	3343	3291	3240	3189	3139	3090	3041	22
23	3610	3555	3501	3447	3394	3342	3290	3239	3188	3138	3089	3040	23
24	3610	3555	3500	3446	3393	3341	3289	3238	3188	3138	3088	3039	24
25	3609	3554	3499	3446	3393	3340	3288	3237	3187	3137	3087	3039	25
26	3608	3553	3498	3445	3392	3339	3288	3236	3186	3136	3087	3038	26
27	3607	3552	3497	3444	3391	3338	3287	3236	3185	3135	3086	3037	27
28	3606	3551	3497	3443	3390	3338	3286	3235	3184	3134	3085	3036	28
29	3605	3550	3496	3442	3389	3337	3285	3234	3183	3133	3084	3035	29
30	3604	3549	3495	3441	3388	3336	3284	3233	3183	3133	3083	3034	30
31	3603	3548	3494	3440	3387	3335	3283	3232	3182	3132	3082	3034	31
32	3602	3547	3493	3439	3386	3334	3282	3231	3181	3131	3082	3033	32
33	3601	3546	3492	3438	3386	3333	3282	3231	3180	3130	3081	3032	33
34	3600	3545	3491	3438	3385	3332	3281	3230	3179	3129	3080	3031	34
35	3599	3545	3490	3437	3384	3332	3280	3229	3178	3129	3079	3030	35
36	3598	3544	3489	3436	3383	3331	3279	3228	3178	3128	3078	3030	36
37	3598	3543	3488	3435	3382	3330	3278	3227	3177	3127	3078	3029	37
38	3597	3542	3488	3434	3381	3329	3277	3226	3176	3126	3077	3028	38
39	3596	3541	3487	3433	3380	3328	3276	3225	3175	3125	3076	3027	39
40	3595	3540	3486	3432	3379	3327	3276	3225	3174	3124	3075	3026	40
41	3594	3539	3485	3431	3379	3326	3275	3224	3173	3124	3074	3026	41
42	3593	3538	3484	3431	3378	3325	3274	3223	3173	3123	3073	3025	42
43	3592	3537	3483	3430	3377	3325	3273	3222	3172	3122	3073	3024	43
44	3591	3536	3482	3429	3376	3324	3272	3221	3171	3121	3072	3023	44
45	3590	3535	3481	3428	3375	3323	3271	3220	3170	3120	3071	3022	45
46	3589	3535	3480	3427	3374	3322	3270	3220	3169	3119	3070	3022	46
47	3588	3534	3480	3426	3373	3321	3270	3219	3168	3119	3069	3021	47
48	3587	3533	3479	3425	3372	3320	3269	3218	3168	3118	3069	3020	48
49	3587	3532	3478	3424	3372	3319	3268	3217	3167	3117	3068	3019	49
50	3586	3531	3477	3423	3371	3319	3267	3216	3166	3116	3067	3018	50
51	3585	3530	3476	3423	3370	3318	3266	3215	3165	3115	3066	3018	51
52	3584	3529	3475	3422	3369	3317	3265	3214	3164	3114	3065	3017	52
53	3583	3528	3474	3421	3368	3316	3265	3214	3163	3114	3065	3016	53
54	3582	3527	3473	3420	3367	3315	3264	3213	3163	3113	3064	3015	54
55	3581	3526	3472	3419	3366	3314	3263	3212	3162	3112	3063	3014	55
56	3580	3525	3471	3418	3365	3313	3262	3211	3161	3111	3062	3014	56
57	3579	3525	3471	3417	3365	3313	3261	3210	3160	3110	3061	3013	57
58	3578	3524	3470	3416	3364	3312	3260	3209	3159	3110	3060	3012	58
59	3577	3523	3469	3415	3363	3311	3259	3209	3158	3109	3060	3011	59
60	3576	3522	3468	3415	3362	3310	3259	3208	3158	3108	3059	3010	60

TABLE XXXVI.

PROPORTIONAL LOGARITHMS.

s. ″	h. m. 1° 30′	h. m. 1° 31′	h. m. 1° 32′	h. m. 1° 33′	h. m. 1° 34′	h. m. 1° 35′	h. m. 1° 36′	h. m. 1° 37′	h. m. 1° 38′	h. m. 1° 39′	h. m. 1° 40′	h. m. 1° 41′	s. ″
0	3010	2962	2915	2868	2821	2775	2730	2685	2640	2596	2553	2510	0
1	3009	2962	2914	2867	2821	2775	2729	2684	2640	2596	2552	2509	1
2	3009	2961	2913	2866	2820	2774	2729	2684	2639	2595	2551	2508	2
3	3008	2960	2912	2866	2819	2773	2728	2683	2638	2594	2551	2507	3
4	3007	2959	2912	2865	2818	2772	2727	2682	2638	2593	2550	2507	4
5	3006	2958	2911	2864	2818	2772	2726	2681	2637	2593	2549	2506	5
6	3005	2958	2910	2863	2817	2771	2725	2681	2636	2592	2548	2505	6
7	3005	2957	2909	2862	2816	2770	2725	2680	2635	2591	2548	2504	7
8	3004	2956	2909	2862	2815	2769	2724	2679	2635	2591	2547	2504	8
9	3003	2955	2908	2861	2815	2769	2723	2678	2634	2590	2546	2503	9
10	3002	2954	2907	2860	2814	2768	2722	2678	2633	2589	2545	2502	10
11	3001	2954	2906	2859	2813	2767	2722	2677	2632	2588	2545	2502	11
12	3001	2953	2905	2859	2812	2766	2721	2676	2632	2588	2544	2501	12
13	3000	2952	2905	2858	2811	2766	2720	2675	2631	2587	2543	2500	13
14	2999	2951	2904	2857	2811	2765	2719	2675	2630	2586	2543	2499	14
15	2998	2950	2903	2856	2810	2764	2719	2674	2629	2585	2542	2499	15
16	2997	2950	2902	2855	2809	2763	2718	2673	2629	2585	2541	2498	16
17	2997	2949	2901	2855	2808	2763	2717	2672	2628	2584	2540	2497	17
18	2996	2948	2901	2854	2808	2762	2716	2672	2627	2583	2540	2497	18
19	2995	2947	2900	2853	2807	2761	2716	2671	2626	2583	2539	2496	19
20	2994	2946	2899	2852	2806	2760	2715	2670	2626	2582	2538	2495	20
21	2993	2946	2898	2852	2805	2760	2714	2669	2625	2581	2538	2494	21
22	2993	2945	2898	2851	2805	2759	2713	2669	2624	2580	2537	2494	22
23	2992	2944	2897	2850	2804	2758	2713	2668	2624	2580	2536	2493	23
24	2991	2943	2896	2849	2803	2757	2712	2667	2623	2579	2535	2492	24
25	2990	2942	2895	2848	2802	2756	2711	2666	2622	2578	2535	2492	25
26	2989	2942	2894	2848	2801	2756	2710	2666	2621	2577	2534	2491	26
27	2989	2941	2894	2847	2801	2755	2710	2665	2621	2577	2533	2490	27
28	2988	2940	2893	2846	2800	2754	2709	2664	2620	2576	2533	2489	28
29	2987	2939	2892	2845	2799	2753	2708	2663	2619	2575	2532	2489	29
30	2986	2939	2891	2845	2798	2753	2707	2663	2618	2574	2531	2488	30
31	2985	2938	2891	2844	2798	2752	2707	2662	2618	2574	2530	2487	31
32	2985	2937	2890	2843	2797	2751	2706	2661	2617	2573	2530	2487	32
33	2984	2936	2889	2842	2796	2750	2705	2660	2616	2572	2529	2486	33
34	2983	2935	2888	2842	2795	2750	2704	2660	2615	2572	2528	2485	34
35	2982	2935	2887	2841	2795	2749	2704	2659	2615	2571	2527	2485	35
36	2981	2934	2887	2840	2794	2748	2703	2658	2614	2570	2527	2484	36
37	2981	2933	2886	2839	2793	2747	2702	2657	2613	2569	2526	2483	37
38	2980	2932	2885	2838	2792	2747	2701	2657	2612	2569	2525	2482	38
39	2979	2931	2884	2838	2792	2746	2701	2656	2612	2568	2525	2482	39
40	2978	2931	2883	2837	2791	2745	2700	2655	2611	2567	2524	2481	40
41	2977	2930	2883	2836	2790	2744	2699	2655	2610	2566	2523	2480	41
42	2977	2929	2882	2835	2789	2744	2698	2654	2610	2566	2522	2480	42
43	2976	2928	2881	2835	2788	2743	2698	2653	2609	2565	2522	2479	43
44	2975	2927	2880	2834	2788	2742	2697	2652	2608	2564	2521	2478	44
45	2974	2927	2880	2833	2787	2741	2696	2652	2607	2564	2520	2477	45
46	2973	2926	2879	2832	2786	2741	2695	2651	2607	2563	2520	2477	46
47	2973	2925	2878	2831	2785	2740	2695	2650	2606	2562	2519	2476	47
48	2972	2924	2877	2831	2785	2739	2694	2649	2605	2561	2518	2475	48
49	2971	2924	2876	2830	2784	2738	2693	2649	2604	2561	2517	2475	49
50	2970	2923	2876	2829	2783	2738	2692	2648	2604	2560	2517	2474	50
51	2969	2922	2875	2828	2782	2737	2692	2647	2603	2559	2516	2473	51
52	2969	2921	2874	2828	2782	2736	2691	2646	2602	2559	2515	2472	52
53	2968	2920	2873	2827	2781	2735	2690	2646	2601	2558	2515	2472	53
54	2967	2920	2873	2826	2780	2735	2689	2645	2601	2557	2514	2471	54
55	2966	2919	2872	2825	2779	2734	2689	2644	2600	2556	2513	2470	55
56	2965	2918	2871	2825	2779	2733	2688	2643	2599	2556	2512	2470	56
57	2965	2917	2870	2824	2778	2732	2687	2643	2599	2555	2512	2469	57
58	2464	2916	2869	2823	2777	2732	2687	2642	2598	2554	2511	2468	58
59	2963	2916	2869	2822	2776	2731	2686	2641	2597	2553	2510	2467	59
60	2962	2915	2868	2821	2775	2730	2685	2640	2596	2553	2510	2467	60

TABLE XXXVI.

PROPORTIONAL LOGARITHMS.

s. ″	h. m. 1° 42′	h. m. 1° 43′	h. m. 1° 44′	h. m. 1° 45′	h. m. 1° 46′	h. m. 1° 47′	h. m. 1° 48′	h. m. 1° 49′	h. m. 1° 50′	h. m. 1° 51′	h. m. 1° 52′	h. 1° 5
0	2467	2424	2382	2341	2300	2259	2218	2178	2139	2099	2061	202
1	2466	2424	2382	2340	2299	2258	2218	2178	2138	2099	2060	202
2	2465	2423	2381	2339	2298	2258	2217	2177	2137	2098	2059	202
3	2465	2422	2380	2339	2298	2257	2216	2176	2137	2098	2059	202
4	2464	2422	2380	2338	2297	2256	2216	2176	2136	2097	2058	201
5	2463	2421	2379	2337	2296	2256	2215	2175	2136	2096	2057	201
6	2462	2420	2378	2337	2296	2255	2214	2174	2135	2096	2057	201
7	2462	2419	2378	2336	2295	2254	2214	2174	2134	2095	2056	201
8	2461	2419	2377	2335	2294	2253	2213	2173	2134	2094	2055	201
9	2460	2418	2376	2335	2294	2253	2212	2172	2133	2094	2055	201
10	2460	2417	2375	2334	2293	2252	2212	2172	2132	2093	2054	201
11	2459	2417	2375	2333	2292	2251	2211	2171	2132	2092	2053	201
12	2458	2416	2374	2333	2291	2251	2210	2170	2131	2092	2053	201
13	2458	2415	2373	2332	2291	2250	2210	2170	2130	2091	2052	201
14	2457	2415	2373	2331	2290	2249	2209	2169	2130	2090	2052	201
15	2456	2414	2372	2331	2289	2249	2208	2169	2129	2090	2051	201
16	2455	2413	2371	2330	2289	2248	2208	2168	2128	2089	2050	201
17	2455	2412	2371	2329	2288	2247	2207	2167	2128	2088	2050	201
18	2454	2412	2370	2328	2287	2247	2206	2167	2127	2088	2049	201
19	2453	2411	2369	2328	2287	2246	2206	2166	2126	2087	2048	201
20	2153	2410	2368	2327	2286	2245	2205	2165	2126	2086	2048	200
21	2452	2410	2368	2326	2285	2245	2204	2165	2125	2086	2047	200
22	2451	2409	2367	2326	2285	2244	2204	2164	2124	2085	2046	200
23	2450	2408	2366	2325	2284	2243	2203	2163	2124	2085	2046	200
24	2450	2408	2366	2324	2283	2243	2202	2163	2123	2084	2045	200
25	2449	2407	2365	2324	2283	2242	2202	2162	2122	2083	2044	200
26	2448	2406	2364	2323	2282	2241	2201	2161	2122	2083	2044	200
27	2448	2405	2364	2322	2281	2241	2200	2161	2121	2082	2043	200
28	2447	2405	2363	2322	2281	2240	2200	2160	2120	2081	2042	200
29	2446	2404	2362	2321	2280	2239	2199	2159	2120	2081	2042	200
30	2445	2403	2362	2320	2279	2239	2198	2159	2119	2080	2041	200
31	2445	2403	2361	2320	2279	2238	2198	2158	2118	2079	2041	200
32	2444	2402	2360	2319	2278	2237	2197	2157	2118	2079	2040	200
33	2443	2401	2359	2318	2277	2237	2196	2157	2117	2078	2039	200
34	2143	2401	2359	2317	2277	2236	2196	2156	2116	2077	2039	200
35	2442	2400	2358	2317	2276	2235	2195	2155	2116	2077	2038	200
36	2441	2399	2357	2316	2275	2235	2194	2155	2115	2076	2037	199
37	2441	2398	2357	2315	2274	2234	2194	2154	2115	2075	2037	199
38	2440	2398	2356	2315	2274	2233	2193	2153	2114	2075	2036	1998
39	2439	2397	2355	2314	2273	2233	2192	2153	2113	2074	2035	1997
40	2438	2396	2355	2313	2272	2232	2192	2152	2113	2073	2035	1996
41	2438	2396	2354	2313	2272	2231	2191	2151	2112	2073	2034	1996
42	2437	2395	2353	2312	2271	2231	2190	2151	2111	2072	2033	1995
43	2436	2394	2353	2311	2270	2230	2190	2150	2111	2072	2033	1994
44	2436	2394	2352	2311	2270	2229	2189	2149	2110	2071	2032	1994
45	2435	2393	2351	2310	2269	2229	2188	2149	2109	2070	2032	1993
46	2434	2392	2350	2309	2268	2228	2188	2148	2109	2070	2031	1992
47	2433	2391	2350	2309	2268	2227	2187	2147	2108	2069	2030	1992
48	2433	2391	2349	2308	2267	2227	2186	2147	2107	2068	2030	1991
49	2432	2390	2348	2307	2266	2226	2186	2146	2107	2068	2029	1991
50	2431	2389	2348	2307	2266	2225	2185	2145	2106	2067	2028	1990
51	2431	2389	2347	2306	2265	2225	2184	2145	2105	2066	2028	1989
52	2430	2388	2346	2305	2264	2224	2184	2144	2105	2066	2027	1989
53	2429	2387	2346	2304	2264	2223	2183	2143	2104	2065	2026	1988
54	2429	2387	2345	2304	2263	2223	2182	2143	2103	2064	2026	1987
55	2428	2386	2344	2303	2262	2222	2182	2142	2103	2064	2025	1987
56	2427	2385	2344	2302	2262	2221	2181	2141	2102	2063	2025	198
57	2426	2384	2343	2302	2261	2220	2180	2141	2101	2062	2024	198
58	2426	2384	2342	2301	2260	2220	2180	2140	2101	2062	2023	198
59	2425	2383	2342	2300	2260	2219	2179	2139	2100	2061	2023	198
60	2424	2382	2341	2300	2259	2218	2178	2139	2099	2061	2022	198

TABLE XXXVI.

PROPORTIONAL LOGARITHMS.

s. ″	h. m. 1° 54′	h. m. 1° 55′	h. m. 1° 56′	h. m. 1° 57′	h. m 1° 58′	h. m. 1° 59′	h. m. 2° 0′	h. m. 2° 1′	h. m. 2° 2′	h. m. 2° 3′	h. m. 2° 4′	s. ″
0	1984	1946	1908	1871	1834	1797	1761	1725	1689	1654	1619	0
1	1983	1945	1908	1870	1833	1797	1760	1724	1689	1653	1618	1
2	1982	1944	1907	1870	1833	1796	1760	1724	1688	1652	1617	2
3	1982	1944	1906	1869	1832	1795	1759	1723	1687	1652	1617	3
4	1981	1943	1906	1868	1831	1795	1759	1722	1687	1651	1616	4
5	1981	1943	1905	1868	1831	1794	1758	1722	1686	1651	1616	5
6	1980	1942	1904	1867	1830	1794	1757	1721	1686	1650	1615	6
7	1979	1941	1904	1867	1830	1793	1757	1721	1685	1650	1614	7
8	1979	1941	1903	1866	1829	1792	1756	1720	1684	1649	1614	8
9	1978	1940	1903	1865	1828	1792	1755	1719	1684	1648	1613	9
10	1977	1939	1902	1865	1828	1791	1755	1719	1683	1648	1613	10
11	1977	1939	1901	1864	1827	1791	1754	1718	1683	1647	1612	11
12	1976	1938	1901	1863	1827	1790	1754	1718	1682	1647	1612	12
13	1975	1938	1900	1863	1826	1789	1753	1717	1681	1646	1611	13
14	1975	1937	1899	1862	1825	1789	1752	1717	1681	1645	1610	14
15	1974	1936	1899	1862	1825	1788	1752	1716	1680	1645	1610	15
16	1974	1936	1898	1861	1824	1788	1751	1715	1680	1644	1609	16
17	1973	1935	1898	1860	1823	1787	1751	1715	1679	1644	1609	17
18	1972	1934	1897	1860	1823	1786	1750	1714	1678	1643	1608	18
19	1972	1934	1896	1859	1822	1786	1749	1714	1678	1643	1607	19
20	1971	1933	1896	1859	1822	1785	1749	1713	1677	1642	1607	20
21	1970	1933	1895	1858	1821	1785	1748	1712	1677	1641	1606	21
22	1970	1932	1894	1857	1820	1784	1748	1712	1676	1641	1606	22
23	1969	1931	1894	1857	1820	1783	1747	1711	1676	1640	1605	23
24	1968	1931	1893	1856	1819	1783	1746	1711	1675	1640	1605	24
25	1968	1930	1893	1855	1819	1782	1746	1710	1674	1639	1604	25
26	1967	1929	1892	1855	1818	1781	1745	1709	1674	1638	1603	26
27	1967	1929	1891	1854	1817	1781	1745	1709	1673	1638	1603	27
28	1966	1928	1891	1854	1817	1780	1744	1708	1673	1637	1602	28
29	1965	1928	1890	1853	1816	1780	1743	1708	1672	1637	1602	29
30	1965	1927	1889	1852	1816	1779	1743	1707	1671	1636	1601	30
31	1964	1926	1889	1852	1815	1778	1742	1706	1671	1635	1600	31
32	1963	1926	1888	1851	1814	1778	1742	1706	1670	1635	1600	32
33	1963	1925	1888	1850	1814	1777	1741	1705	1670	1634	1599	33
34	1962	1924	1887	1850	1813	1777	1740	1705	1669	1634	1599	34
35	1962	1924	1886	1849	1812	1776	1740	1704	1668	1633	1598	35
36	1961	1923	1886	1849	1812	1775	1739	1703	1668	1633	1598	36
37	1960	1923	1885	1848	1811	1775	1739	1703	1667	1632	1597	37
38	1960	1922	1884	1847	1811	1774	1738	1702	1667	1631	1596	38
39	1959	1921	1884	1847	1810	1774	1737	1702	1666	1631	1596	39
40	1958	1921	1883	1846	1809	1773	1737	1701	1665	1630	1595	40
41	1958	1920	1883	1846	1809	1772	1736	1700	1665	1630	1595	41
42	1957	1919	1882	1845	1808	1772	1736	1700	1664	1629	1594	42
43	1956	1919	1881	1844	1808	1771	1735	1699	1664	1628	1593	43
44	1956	1918	1881	1844	1807	1771	1734	1699	1663	1628	1593	44
45	1955	1918	1880	1843	1806	1770	1734	1698	1663	1627	1592	45
46	1955	1917	1880	1843	1806	1769	1733	1697	1662	1627	1592	46
47	1954	1916	1879	1842	1805	1769	1733	1697	1661	1626	1591	47
48	1953	1916	1878	1841	1805	1768	1732	1696	1661	1626	1591	48
49	1953	1915	1878	1841	1804	1768	1731	1696	1660	1625	1590	49
50	1952	1914	1877	1840	1803	1767	1731	1695	1660	1624	1589	50
51	1951	1914	1876	1839	1803	1766	1730	1694	1659	1624	1589	51
52	1951	1913	1876	1839	1802	1766	1730	1694	1658	1623	1588	52
53	1950	1913	1875	1838	1802	1765	1729	1693	1658	1623	1588	53
54	1950	1912	1875	1838	1801	1765	1728	1693	1657	1622	1587	54
55	1949	1911	1874	1837	1800	1764	1728	1692	1657	1621	1587	55
56	1948	1911	1873	1836	1800	1763	1727	1692	1656	1621	1586	56
57	1948	1910	1873	1836	1799	1763	1727	1691	1655	1620	1585	57
58	1947	1909	1872	1835	1798	1762	1726	1690	1655	1620	1585	58
59	1946	1909	1871	1835	1798	1762	1725	1690	1654	1619	1584	59
60	1946	1908	1871	1834	1797	1761	1725	1689	1654	1619	1584	60

TABLE XXXVI.

PROPORTIONAL LOGARITHMS.

s. ″	h. m. 2° 5′	h. m. 2° 6′	h. m. 2° 7′	h. m. 2° 8′	h. m. 2° 9	h. m. 2° 10′	h. m. 2° 11′	h. m. 2° 12′	h. m. 2° 13′	h. m. 2° 14′	h. m 2° 15′	
0	1584	1549	1515	1481	1447	1413	1380	1347	1314	1282	1249	
1	1583	1548	1514	1480	1446	1413	1379	1346	1314	1281	1249	
2	1582	1548	1514	1479	1446	1412	1379	1346	1313	1281	1248	
3	1582	1547	1513	1479	1445	1412	1378	1345	1313	1280	1248	
4	1581	1547	1512	1478	1445	1411	1378	1345	1312	1280	1247	
5	1581	1546	1512	1478	1444	1411	1377	1344	1311	1279	1247	
6	1580	1546	1511	1477	1443	1410	1377	1344	1311	1278	1246	
7	1580	1545	1511	1477	1443	1409	1376	1343	1310	1278	1246	
8	1579	1544	1510	1476	1442	1409	1376	1343	1310	1277	1245	
9	1578	1544	1510	1476	1442	1408	1375	1342	1309	1277	1245	
10	1578	1543	1509	1475	1441	1408	1374	1342	1309	1276	1244	
11	1577	1543	1508	1474	1441	1407	1374	1341	1308	1276	1243	
12	1577	1542	1508	1474	1440	1407	1373	1340	1308	1275	1243	
13	1576	1542	1507	1473	1440	1406	1373	1340	1307	1275	1242	
14	1576	1541	1507	1473	1439	1406	1372	1339	1307	1274	1242	
15	1575	1540	1506	1472	1438	1405	1372	1339	1306	1274	1241	
16	1574	1540	1506	1472	1438	1404	1371	1338	1306	1273	1241	
17	1574	1539	1505	1471	1437	1404	1371	1338	1305	1273	1240	
18	1573	1539	1504	1470	1437	1403	1370	1337	1304	1272	1240	
19	1573	1538	1504	1470	1436	1403	1370	1337	1304	1271	1239	
20	1572	1538	1503	1469	1436	1402	1369	1336	1303	1271	1239	
21	1571	1537	1503	1469	1435	1402	1368	1335	1303	1270	1238	
22	1571	1536	1502	1468	1435	1401	1368	1335	1302	1270	1238	
23	1570	1536	1502	1468	1434	1401	1367	1334	1302	1269	1237	
24	1570	1535	1501	1467	1433	1400	1367	1334	1301	1269	1237	
25	1569	1535	1500	1467	1433	1399	1366	1333	1301	1268	1236	
26	1569	1534	1500	1466	1432	1399	1366	1333	1300	1268	1235	
27	1568	1534	1499	1465	1432	1398	1365	1332	1300	1267	1235	
28	1567	1533	1499	1465	1431	1398	1365	1332	1299	1267	1234	
29	1567	1532	1498	1464	1431	1397	1364	1331	1298	1266	1234	
30	1566	1532	1498	1464	1430	1397	1363	1331	1298	1266	1233	30
31	1566	1531	1497	1463	1429	1396	1363	1330	1297	1265	1233	31
32	1565	1531	1496	1463	1429	1396	1362	1329	1297	1264	1232	32
33	1565	1530	1496	1462	1428	1395	1362	1329	1296	1264	1232	33
34	1564	1530	1495	1461	1428	1394	1361	1328	1296	1263	1231	34
35	1563	1529	1495	1461	1427	1394	1361	1328	1295	1263	1231	35
36	1563	1528	1494	1460	1427	1393	1360	1327	1295	1262	1230	36
37	1562	1528	1494	1460	1426	1393	1360	1327	1294	1262	1230	37
38	1562	1527	1493	1459	1426	1392	1359	1326	1294	1261	1229	38
39	1561	1527	1493	1459	1425	1392	1359	1326	1293	1261	1229	39
40	1561	1526	1492	1458	1424	1391	1358	1325	1292	1260	1228	40
41	1560	1526	1491	1458	1424	1391	1357	1325	1292	1260	1227	41
42	1559	1525	1491	1457	1423	1390	1357	1324	1291	1259	1227	42
43	1559	1524	1490	1456	1423	1389	1356	1323	1291	1259	1226	43
44	1558	1524	1490	1456	1422	1389	1356	1323	1290	1258	1226	44
45	1558	1523	1489	1455	1422	1388	1355	1322	1290	1257	1225	45
46	1557	1523	1489	1455	1421	1388	1355	1322	1289	1257	1225	46
47	1556	1522	1488	1454	1421	1387	1354	1321	1289	1256	1224	47
48	1556	1522	1487	1454	1420	1387	1354	1321	1288	1256	1224	48
49	1555	1521	1487	1453	1419	1386	1353	1320	1288	1255	1223	49
50	1555	1520	1486	1452	1419	1386	1352	1320	1287	1255	1223	50
51	1554	1520	1486	1452	1418	1385	1352	1319	1287	1254	1222	51
52	1554	1519	1485	1451	1418	1384	1351	1319	1286	1254	1222	52
53	1553	1519	1485	1451	1417	1384	1351	1318	1285	1253	1221	53
54	1552	1518	1484	1450	1417	1383	1350	1317	1285	1253	1221	54
55	1552	1518	1483	1450	1416	1383	1350	1317	1284	1252	1220	55
56	1551	1517	1483	1449	1416	1382	1349	1316	1284	1252	1219	56
57	1551	1516	1482	1449	1415	1382	1349	1316	1283	1251	1219	57
58	1550	1516	1482	1448	1414	1381	1348	1315	1283	1250	1218	58
59	1550	1515	1481	1447	1414	1381	1348	1315	1282	1250	1218	59
60	1549	1515	1481	1447	1413	1380	1347	1314	1282	1249	1217	60

TABLE XXXVI.

PROPORTIONAL LOGARITHMS.

s. ″	h. m. 2° 16′	h. m 2° 17′	h. m. 2° 18′	h. m. 2° 19′	h. m. 2° 20′	h. m. 2° 21′	h. m. 2° 22′	h. m 2° 23′	h. m. 2° 24′	h. m. 2° 25′	h. m. 2° 26′	s. ″
0	1217	1186	1154	1123	1091	1061	1030	0999	0969	0939	0909	0
1	1217	1185	1153	1122	1091	1060	1029	0999	0969	0939	0909	1
2	1216	1184	1153	1122	1090	1060	1029	0998	0968	0938	0908	2
3	1216	1184	1152	1121	1090	1059	1028	0998	0968	0938	0908	3
4	1215	1183	1152	1120	1089	1058	1028	0997	0967	0937	0907	4
5	1215	1183	1151	1120	1089	1058	1027	0997	0967	0937	0907	5
6	1214	1182	1151	1119	1088	1057	1027	0996	0966	0936	0906	6
7	1214	1182	1150	1119	1088	1057	1026	0996	0966	0936	0906	7
8	1213	1181	1150	1118	1087	1056	1026	0995	0965	0935	0905	8
9	1213	1181	1149	1118	1087	1056	1025	0995	0965	0935	0905	9
10	1212	1180	1149	1117	1086	1055	1025	0994	0964	0934	0904	10
11	1211	1180	1148	1117	1086	1055	1024	0994	0964	0934	0904	11
12	1211	1179	1148	1116	1085	1054	1024	0993	0963	0933	0903	12
13	1210	1179	1147	1116	1085	1054	1023	0993	0963	0933	0903	13
14	1210	1178	1147	1115	1084	1053	1023	0992	0962	0932	0902	14
15	1209	1178	1146	1115	1084	1053	1022	0992	0962	0932	0902	15
16	1209	1177	1146	1114	1083	1052	1022	0991	0961	0931	0901	16
17	1208	1177	1145	1114	1083	1052	1021	0991	0961	0931	0901	17
18	1208	1176	1145	1113	1082	1051	1021	0990	0960	0930	0900	18
19	1207	1175	1144	1113	1082	1051	1020	0990	0960	0930	0900	19
20	1207	1175	1143	1112	1081	1050	1020	0989	0959	0929	0899	20
21	1206	1174	1143	1112	1081	1050	1019	0989	0959	0929	0899	21
22	1206	1174	1142	1111	1080	1049	1019	0988	0958	0928	0898	22
23	1205	1173	1142	1111	1080	1049	1018	0988	0958	0928	0898	23
24	1205	1173	1141	1110	1079	1048	1018	0987	0957	0927	0897	24
25	1204	1172	1141	1110	1079	1048	1017	0987	0957	0927	0897	25
26	1204	1172	1140	1109	1078	1047	1017	0986	0956	0926	0896	26
27	1203	1171	1140	1109	1078	1047	1016	0986	0956	0926	0896	27
28	1202	1171	1139	1108	1077	1046	1016	0985	0955	0925	0895	28
29	1202	1170	1139	1108	1076	1046	1015	0985	0955	0925	0895	29
30	1201	1170	1138	1107	1076	1045	1015	0984	0954	0924	0894	30
31	1201	1169	1138	1106	1075	1045	1014	0984	0954	0924	0894	31
32	1200	1169	1137	1106	1075	1044	1014	0983	0953	0923	0893	32
33	1200	1168	1137	1105	1074	1044	1013	0983	0953	0923	0893	33
34	1199	1168	1136	1105	1074	1043	1013	0982	0952	0922	0892	34
35	1199	1167	1136	1104	1073	1043	1012	0982	0952	0922	0892	35
36	1198	1167	1135	1104	1073	1042	1012	0981	0951	0921	0891	36
37	1198	1166	1135	1103	1072	1042	1011	0981	0951	0921	0891	37
38	1197	1165	1134	1103	1072	1041	1011	0980	0950	0920	0890	38
39	1197	1165	1134	1102	1071	1041	1010	0980	0950	0920	0890	39
40	1196	1164	1133	1102	1071	1040	1009	0979	0949	0919	0889	40
41	1196	1164	1132	1101	1070	1040	1009	0979	0949	0919	0889	41
42	1195	1163	1132	1101	1070	1039	1008	0978	0948	0918	0888	42
43	1195	1163	1131	1100	1069	1039	1008	0978	0948	0918	0888	43
44	1194	1162	1131	1100	1069	1038	1007	0977	0947	0917	0887	44
45	1193	1162	1130	1099	1068	1037	1007	0977	0947	0917	0887	45
46	1193	1161	1130	1099	1068	1037	1006	0976	0946	0916	0886	46
47	1192	1161	1129	1098	1067	1036	1006	0976	0946	0916	0886	47
48	1192	1160	1129	1098	1067	1036	1005	0975	0945	0915	0885	48
49	1191	1160	1128	1097	1066	1035	1005	0975	0945	0915	0885	49
50	1191	1159	1128	1097	1066	1035	1004	0974	0944	0914	0884	50
51	1190	1159	1127	1096	1065	1034	1004	0974	0944	0914	0884	51
52	1190	1158	1127	1096	1065	1034	1003	0973	0943	0913	0883	52
53	1189	1158	1126	1095	1064	1033	1003	0973	0943	0913	0883	53
54	1189	1157	1126	1095	1064	1033	1002	0972	0942	0912	0883	54
55	1188	1157	1125	1094	1063	1032	1002	0972	0942	0912	0882	55
56	1188	1156	1125	1094	1063	1032	1001	0971	0941	0911	0882	56
57	1187	1156	1124	1093	1062	1031	1001	0971	0941	0911	0881	57
58	1187	1155	1124	1092	1062	1031	1000	0970	0940	0910	0881	58
59	1186	1154	1123	1092	1061	1030	1000	0970	0940	0910	0880	59
60	1186	1154	1123	1091	1061	1030	0999	0969	0939	0909	0880	60

TABLE XXXVI.

PROPORTIONAL LOGARITHMS.

s. ″	h. m. 2° 27′	h. m. 2° 28′	h. m. 2° 29′	h. m. 2° 30′	h. m. 2° 31′	h. m. 2° 32′	h. m. 2° 33	h. m. 2° 34′	h. m. 2° 35′	h. m. 2° 36′	h. m. 2° 37	s. ″
0	0880	0850	0821	0792	0763	0734	0706	0678	0649	0621	0594	0
1	0879	0850	0820	0791	0762	0734	0705	0677	0649	0621	0593	1
2	0879	0849	0820	0791	0762	0733	0705	0677	0648	0621	0593	2
3	0878	0849	0819	0790	0762	0733	0704	0676	0648	0620	0592	3
4	0878	0848	0819	0790	0761	0732	0704	0676	0648	0620	0592	4
5	0877	0848	0818	0789	0761	0732	0703	0675	0647	0619	0591	5
6	0877	0847	0818	0789	0760	0731	0703	0675	0647	0619	0591	6
7	0876	0847	0817	0788	0760	0731	0703	0674	0646	0618	0591	7
8	0876	0846	0817	0788	0759	0730	0702	0674	0646	0618	0590	8
9	0875	0846	0816	0787	0759	0730	0702	0673	0645	0617	0590	9
10	0875	0845	0816	0787	0758	0730	0701	0673	0645	0617	0589	10
11	0874	0845	0816	0787	0758	0729	0701	0672	0644	0616	0589	11
12	0874	0844	0815	0786	0757	0729	0700	0672	0644	0616	0588	12
13	0873	0844	0815	0786	0757	0728	0700	0671	0643	0615	0588	13
14	0873	0843	0814	0785	0756	0728	0699	0671	0643	0615	0587	14
15	0872	0843	0814	0785	0756	0727	0699	0670	0642	0615	0587	15
16	0872	0842	0813	0784	0755	0727	0698	0670	0642	0614	0586	16
17	0871	0842	0813	0784	0755	0726	0698	0670	0641	0614	0586	17
18	0871	0841	0812	0783	0754	0726	0697	0669	0641	0613	0585	18
19	0870	0841	0812	0783	0754	0725	0697	0669	0641	0613	0585	19
20	0870	0840	0811	0782	0753	0725	0696	0668	0640	0612	0585	20
21	0869	0840	0811	0782	0753	0724	0696	0668	0640	0612	0584	21
22	0869	0839	0810	0781	0752	0724	0695	0667	0639	0611	0584	22
23	0868	0839	0810	0781	0752	0723	0695	0667	0639	0611	0583	23
24	0868	0838	0809	0780	0751	0723	0695	0666	0638	0610	0583	24
25	0867	0838	0809	0780	0751	0722	0694	0666	0638	0610	0582	25
26	0867	0837	0808	0779	0751	0722	0694	0665	0637	0609	0582	26
27	0866	0837	0808	0779	0750	0721	0693	0665	0637	0609	0581	27
28	0866	0836	0807	0778	0750	0721	0693	0664	0636	0609	0581	28
29	0865	0836	0807	0778	0749	0721	0692	0664	0636	0608	0580	29
30	0865	0835	0806	0777	0749	0720	0692	0663	0635	0608	0580	30
31	0864	0835	0806	0777	0748	0720	0691	0663	0635	0607	0579	31
32	0864	0834	0805	0776	0748	0719	0691	0663	0634	0607	0579	32
33	0863	0834	0805	0776	0747	0719	0690	0662	0634	0606	0579	33
34	0863	0834	0804	0775	0747	0718	0690	0662	0634	0606	0578	34
35	0862	0833	0804	0775	0746	0718	0689	0661	0633	0605	0578	35
36	0862	0833	0803	0774	0746	0717	0689	0661	0633	0605	0577	36
37	0861	0832	0803	0774	0745	0717	0688	0660	0632	0604	0577	37
38.	0861	0832	0802	0774	0745	0716	0688	0660	0632	0604	0576	38
39	0860	0831	0802	0773	0744	0716	0687	0659	0631	0603	0576	39
40	0860	0831	0801	0773	0744	0715	0687	0659	0631	0603	0575	40
41	0859	0830	0801	0772	0743	0715	0686	0658	0630	0602	0575	41
42	0859	0830	0801	0772	0743	0714	0686	0658	0630	0602	0574	42
43	0858	0829	0800	0771	0742	0714	0686	0657	0629	0602	0574	43
44	0858	0829	0800	0771	0742	0713	0685	0657	0629	0601	0573	44
45	0857	0828	0799	0770	0741	0713	0685	0656	0628	0601	0573	45
46	0857	0828	0799	0770	0741	0712	0684	0656	0628	0600	0573	46
47	0856	0827	0798	0769	0740	0712	0684	0655	0628	0600	0572	47
48	0856	0827	0798	0769	0740	0711	0683	0655	0627	0599	0572	48
49	0855	0826	0797	0768	0740	0711	0683	0655	0627	0599	0571	49
50	0855	0826	0797	0768	0739	0711	0682	0654	0626	0598	0571	50
51	0855	0825	0796	0767	0739	0710	0682	0654	0626	0598	0570	51
52	0854	0825	0796	0767	0738	0710	0681	0653	0625	0597	0570	52
53	0854	0824	0795	0766	0738	0709	0681	0653	0625	0597	0569	53
54	0853	0824	0795	0766	0737	0709	0680	0652	0624	0596	0569	54
55	0853	0823	0794	0765	0737	0708	0680	0652	0624	0596	0568	55
56	0852	0823	0794	0765	0736	0708	0679	0651	0623	0596	0568	56
57	0852	0822	0793	0764	0736	0707	0670	0651	0623	0595	0568	57
58	0851	0822	0793	0764	0735	0707	0678	0650	0622	0595	0567	58
59	0851	0821	0792	0763	0735	0706	0678	0650	0622	0594	0567	59
60	0850	0821	0792	0763	0734	0706	0678	0649	0621	0594	0566	60

PROPORTIONAL LOGARITHMS.

s. ″	h. m. 2° 38′	h. m. 2° 39′	h. m. 2° 40′	h. m. 2° 41′	h. m 2° 42′	h. m 2° 43′	h. m. 2° 44′	h. m. 2° 45′	h. m. 2° 46′	h. m. 2° 47′	h. m. 2° 48′	s. ″
0	0566	0539	0512	0484	0458	0431	0404	0378	0352	0326	0300	0
1	0566	0538	0511	0484	0457	0430	0404	0377	0351	0325	0299	1
2	0565	0538	0511	0484	0457	0430	0403	0377	0351	0325	0299	2
3	0565	0537	0510	0483	0456	0430	0403	0377	0350	0324	0298	3
4	0564	0537	0510	0483	0456	0429	0403	0376	0350	0324	0298	4
5	0564	0536	0509	0482	0455	0429	0402	0376	0349	0323	0297	5
6	0563	0536	0509	0482	0455	0428	0402	0375	0349	0323	0297	6
7	0563	0536	0508	0481	0454	0428	0401	0375	0349	0323	0297	7
8	0562	0535	0508	0481	0454	0427	0401	0374	0348	0322	0296	8
9	0562	0535	0507	0480	0454	0427	0400	0374	0348	0322	0296	9
10	0562	0534	0507	0480	0453	0426	0400	0374	0347	0321	0295	10
11	0561	0534	0507	0480	0453	0426	0399	0373	0347	0321	0295	11
12	0561	0533	0506	0479	0452	0426	0399	0373	0346	0320	0294	12
13	0560	0533	0506	0479	0452	0425	0399	0372	0346	0320	0294	13
14	0560	0532	0505	0478	0451	0425	0398	0372	0346	0319	0294	14
15	0559	0532	0505	0478	0451	0424	0398	0371	0345	0319	0293	15
16	0559	0531	0504	0477	0450	0424	0397	0371	0345	0319	0293	16
17	0558	0531	0504	0477	0450	0423	0397	0370	0344	0318	0292	17
18	0558	0531	0503	0476	0450	0423	0396	0370	0344	0318	0292	18
19	0557	0530	0503	0476	0449	0422	0396	0370	0343	0317	0291	19
20	0557	0530	0502	0475	0449	0422	0395	0369	0343	0317	0291	20
21	0557	0529	0502	0475	0448	0422	0395	0369	0342	0316	0291	21
22	0556	0529	0502	0475	0448	0421	0395	0368	0342	0316	0290	22
23	0556	0528	0501	0474	0447	0421	0394	0368	0342	0316	0290	23
24	0555	0528	0501	0474	0447	0420	0394	0367	0341	0315	0289	24
25	0555	0527	0500	0473	0446	0420	0393	0367	0341	0315	0289	25
26	0554	0527	0500	0473	0446	0419	0393	0366	0340	0314	0288	26
27	0554	0526	0499	0472	0446	0419	0392	0366	0340	0314	0288	27
28	0553	0526	0499	0472	0445	0418	0392	0366	0339	0313	0288	28
29	0553	0526	0498	0471	0445	0418	0391	0365	0339	0313	0287	29
30	0552	0525	0498	0471	0444	0418	0391	0365	0339	0313	0287	30
31	0552	0525	0498	0471	0444	0417	0391	0364	0338	0312	0286	31
32	0552	0524	0497	0470	0443	0417	0390	0364	0338	0312	0286	32
33	0551	0524	0497	0470	0443	0416	0390	0363	0337	0311	0285	33
34	0551	0523	0496	0469	0442	0416	0389	0363	0337	0311	0285	34
35	0550	0523	0496	0469	0442	0415	0389	0363	0336	0310	0285	35
36	0550	0522	0495	0468	0442	0415	0388	0362	0336	0310	0284	36
37	0549	0522	0495	0468	0441	0414	0388	0362	0336	0310	0284	37
38	0549	0521	0494	0467	0441	0414	0388	0361	0335	0309	0283	38
39	0548	0521	0494	0467	0440	0414	0387	0361	0335	0309	0283	39
40	0548	0521	0493	0467	0440	0413	0387	0360	0334	0308	0282	40
41	0547	0520	0493	0466	0439	0413	0386	0360	0334	0308	0282	41
42	0547	0520	0493	0466	0439	0412	0386	0359	0333	0307	0282	42
43	0546	0519	0492	0465	0438	0412	0385	0359	0333	0307	0281	43
44	0546	0519	0492	0465	0438	0411	0385	0359	0333	0307	0281	44
45	0546	0518	0491	0464	0438	0411	0384	0358	0332	0306	0280	45
46	0545	0518	0491	0464	0437	0410	0384	0358	0332	0306	0280	46
47	0545	0517	0490	0463	0437	0410	0384	0357	0331	0305	0279	47
48	0544	0517	0490	0463	0436	0410	0383	0357	0331	0305	0279	48
49	0544	0517	0489	0462	0436	0409	0383	0356	0330	0304	0279	49
50	0543	0516	0489	0462	0435	0409	0382	0356	0330	0304	0278	50
51	0543	0516	0489	0462	0435	0408	0382	0356	0329	0304	0278	51
52	0542	0515	0488	0461	0434	0408	0381	0355	0329	0303	0277	52
53	0542	0515	0488	0461	0434	0407	0381	0355	0329	0303	0277	53
54	0541	0514	0487	0460	0434	0407	0381	0354	0328	0302	0276	54
55	0541	0514	0487	0460	0433	0406	0380	0354	0328	0302	0276	55
56	0541	0513	0486	0459	0433	0406	0380	0353	0327	0301	0276	56
57	0540	0513	0486	0459	0432	0406	0379	0353	0327	0301	0275	57
58	0540	0512	0485	0458	0432	0405	0379	0353	0326	0300	0275	58
59	0539	0512	0485	0458	0431	0405	0378	0352	0326	0300	0274	59
60	0539	0512	0484	0458	0431	0404	0378	0352	0326	0300	0274	60

TABLE XXXVI.

PROPORTIONAL LOGARITHMS.

s. ″	h. m 2° 49′	h. m. 2° 50′	h. m. 2° 51′	h. m. 2° 52′	h. m. 2° 53′	h. m. 2° 54′	h. m. 2° 55′	h. m. 2° 56′	h. m. 2° 57′	h. m. 2° 58′	h m 2° 59′	s. ″
0	0274	0248	0223	0197	0172	0147	0122	0098	0073	0049	0024	0
1	0273	0248	0222	0197	0172	0147	0122	0097	0073	0048	0024	1
2	0273	0247	0222	0197	0171	0146	0122	0097	0072	0048	0023	2
3	0273	0247	0221	0196	0171	0146	0121	0096	0072	0047	0023	3
4	0272	0247	0221	0196	0171	0146	0121	0096	0071	0047	0023	4
5	0272	0246	0221	0195	0170	0145	0120	0096	0071	0046	0022	5
6	0271	0246	0220	0195	0170	0145	0120	0095	0071	0046	0022	6
7	0271	0245	0220	0194	0169	0144	0119	0095	0070	0046	0021	7
8	0270	0245	0219	0194	0169	0144	0119	0094	0070	0045	0021	8
9	0270	0244	0219	0194	0169	0143	0119	0094	0069	0045	0021	9
10	0270	0244	0219	0193	0168	0143	0118	0093	0069	0044	0020	10
11	0269	0244	0218	0193	0168	0143	0118	0093	0068	0044	0020	11
12	0269	0243	0218	0192	0167	0142	0117	0093	0068	0044	0019	12
13	0268	0243	0217	0192	0167	0142	0117	0092	0068	0043	0019	13
14	0268	0242	0217	0192	0166	0141	0117	0092	0067	0043	0019	14
15	0267	0242	0216	0191	0166	0141	0116	0091	0067	0042	0018	15
16	0267	0241	0216	0191	0166	0141	0116	0091	0066	0042	0018	16
17	0267	0241	0216	0190	0165	0140	0115	0091	0066	0042	0017	17
18	0266	0241	0215	0190	0165	0140	0115	0090	0066	0041	0017	18
19	0266	0240	0215	0189	0164	0139	0114	0090	0065	0041	0017	19
20	0265	0240	0214	0189	0164	0139	0114	0089	0065	0040	0016	20
21	0265	0239	0214	0189	0163	0139	0114	0089	0064	0040	0016	21
22	0264	0239	0213	0188	0163	0138	0113	0089	0064	0040	0015	22
23	0264	0238	0213	0188	0163	0138	0113	0088	0064	0039	0015	23
24	0264	0238	0213	0187	0162	0137	0112	0088	0063	0039	0015	24
25	0263	0238	0212	0187	0162	0137	0112	0087	0063	0038	0014	25
26	0263	0237	0212	0187	0161	0136	0112	0087	0062	0038	0014	26
27	0262	0237	0211	0186	0161	0136	0111	0087	0062	0038	0013	27
28	0262	0236	0211	0186	0161	0136	0111	0086	0062	0037	0013	28
29	0261	0236	0211	0185	0160	0135	0110	0086	0061	0037	0012	29
30	0261	0235	0210	0185	0160	0135	0110	0085	0061	0036	0012	30
31	0261	0235	0210	0184	0159	0134	0110	0085	0060	0036	0012	31
32	0260	0235	0209	0184	0159	0134	0109	0084	0060	0036	0011	32
33	0260	0234	0209	0184	0158	0134	0109	0084	0060	0035	0011	33
34	0259	0234	0208	0183	0158	0133	0108	0084	0059	0035	0010	34
35	0259	0233	0208	0183	0158	0133	0108	0083	0059	0034	0010	35
36	0258	0233	0208	0182	0157	0132	0107	0083	0058	0034	0010	36
37	0258	0233	0207	0182	0157	0132	0107	0082	0058	0034	0009	37
38	0258	0232	0207	0181	0156	0131	0107	0082	0057	0033	0009	38
39	0257	0232	0206	0181	0156	0131	0106	0082	0057	0033	0008	39
40	0257	0231	0206	0181	0156	0131	0106	0081	0057	0032	0008	40
41	0256	0231	0205	0180	0155	0130	0105	0081	0056	0032	0008	41
42	0256	0230	0205	0180	0155	0130	0105	0080	0056	0031	0007	42
43	0255	0230	0205	0179	0154	0129	0105	0080	0055	0031	0007	43
44	0255	0230	0204	0179	0154	0129	0104	0080	0055	0031	0006	44
45	0255	0229	0204	0179	0153	0129	0104	0079	0055	0030	0006	45
46	0254	0229	0203	0178	0153	0128	0103	0079	0054	0030	0006	46
47	0254	0228	0203	0178	0153	0128	0103	0078	0054	0029	0005	47
48	0253	0228	0202	0177	0152	0127	0103	0078	0053	0029	0005	48
49	0253	0227	0202	0177	0152	0127	0102	0077	0053	0029	0004	49
50	0252	0227	0202	0176	0151	0126	0102	0077	0053	0028	0004	50
51	0252	0227	0201	0176	0151	0126	0101	0077	0052	0028	0004	51
52	0252	0226	0201	0176	0151	0126	0101	0076	0052	0027	0003	52
53	0251	0226	0200	0175	0150	0125	0100	0076	0051	0027	0003	53
54	0251	0225	0200	0175	0150	0125	0100	0075	0051	0027	0002	54
55	0250	0225	0200	0174	0149	0124	0100	0075	0051	0026	0002	55
56	0250	0224	0199	0174	0149	0124	0099	0075	0050	0026	0002	56
57	0250	0224	0199	0174	0148	0124	0099	0074	0050	0025	0001	57
58	0249	0224	0198	0173	0148	0123	0098	0074	0049	0025	0001	58
59	0249	0223	0198	0173	0148	0123	0098	0073	0049	0025	0000	59
60	0248	0223	0197	0172	0147	0122	0098	0073	0049	0024	0000	60

TABLE XXXVII.

The Right Ascensions and Declinations of the Principal Fixed Stars, adapted to the st January, 1833.

Names.	Mag.	Right Ascension in Time.			Ann. Var. add.	Declination.				Ann. Var.
		h.	m.	s.	s.	°	′	″		″
γ Pegasus ....*Algenib*	2	0	4	38	3.1	14	15	20	N	+ 20
α Phœnix	2.3	0	18	1	3.0	43	12	10	S	− 20
β Cetus	2.3	0	35	11	3.0	18	54	16	S	− 20
β Andromeda ....*Mirach*.....	2	1	0	22	3.3	34	44	0	N	+ 19
α Eridanus ....*Achernar*...	1	1	31	27	2.2	58	5	7	S	− 19
α Aries ....ARIETIS	2	1	57	46	3.4	22	40	7	N	+ 17
γ Cetus	3	2	34	38	3.1	2	32	2	N	+ 16
α Cetus ....*Menkar*	2	2	53	32	3.1	3	25	56	N	+ 15
β Perseus ....*Algol*.....	Var.	2	57	20	3.8	40	18	21	N	+ 14
α Perseus	2	3	12	25	4.2	49	15	42	N	+ 14
α Taurus ....ALDEBARAN .	1	4	26	20	3.4	16	10	6	N	+ 8
α Auriga ....*Capella*	1	5	4	21	4.4	45	49	14	N	+ 5
β Orion ....*Rigel*......	1	5	6	31	2.9	8	23	55	S	− 5
β Taurus	2	5	15	45	3.8	28	27	35	N	+ 4
γ Orion ....*Bellatrix*...	2	5	16	10	3.2	6	11	35	N	+ 4
α Columba	2	5	33	37	2.2	34	10	2	S	− 2
κ Orion	2.3	5	39	50	2.8	9	43	57	S	− 2
α Orion ....*Betelguese*..	1	5	46	8	3.3	7	22	8	N	+ 1
α Argo Navis ....*Canopus*....	1	6	20	14	1.3	52	36	27	S	+ 2
α Canis Major ......*Sirius*	1	6	37	47	2.6	16	29	24	S	+ 4
δ Canis Major	2.3	7	1	36	2.4	26	7	59	S	+ 5
α Gemini ....*Castor*	1	7	23	56	3.8	32	14	53	N	− 7
η Canis Major	2.3	7	17	30	2.4	28	58	55	S	+ 7
α Canis Minor.......*Procyon*....	1.2	7	30	34	3.2	5	38	50	N	− 9
β Gemini...........POLLUX	1	7	35	5	3.7	28	25	24	N	− 8
ξ Argo Navis	2	7	57	43	2.1	39	32	8	S	+ 10
γ Argo Navis	2	8	4	24	1.8	46	50	41	S	+ 10
δ Argo Navis	2	8	40	6	1.6	54	5	42	S	+ 13
β Argo Navis	1	9	11	23	0.7	69	1	57	S	+ 15
α Hydra............*Alphard*....	2	9	19	23	3.0	7	56	13	S	+ 15
α Leo ....REGULUS ...	1	9	59	27	3.2	12	46	54	N	− 17
β Ursa Major	2	10	51	43	3.7	57	16	34	N	− 19
α Ursa Major ....*Dubhe*	1.2	10	53	21	3.8	62	39	6	N	− 19
β Leo ....*Deneb*	2	11	40	33	3.1	15	30	22	N	− 20
α Crux....................	1	12	17	23	3.2	62	10	29	S	+ 20
γ Crux....................	2	12	21	55	3.3	56	10	21	S	+ 20
β Crux....................	2	12	38	1	3.4	58	46	33	S	+ 20
α Virgo ....SPICA	1	13	16	24	3.1	10	17	10	S	+ 19
γ Ursa Major ....*Benetnach* ..	2	13	40	58	2.4	50	9	00	N	− 18
β Centaurus	2	13	52	7	4.1	59	33	44	S	+ 18
α Draco....................	2.3	13	59	53	1.6	65	10	35	N	− 17
α Bootes ....*Arcturus* ...	1	14	8	3	2.7	20	3	21	N	− 19
α Centaurus	1	14	28	58	4.4	60	9	29	S	+ 16
α Libra ....*Zubenesch* ..	2.3	14	41	34	3.3	15	19	3	S	+ 15
β Libra ....*Zubenelg* ...	2.3	15	8	3	3.2	8	45	44	S	+ 14
α Corona Borealis ...*Alphacca* ...	2	15	27	38	2.5	27	16	59	N	− 12
α Serpens.	2	15	36	2	2.9	6	57	23	N	− 12
α Scorpio...........ANTARES ...	1	16	19	9	3.6	26	3	11	S	+ 9
α Hercules. ....*Ras Algethi*.	2	17	7	12	2.7	14	35	20	N	− 4
α Serpentarius ......*Ras Alhague*	2	17	27	11	2.8	12	41	20	N	− 3
γ Draco............*Rastaban*...	2.3	17	52	44	1.4	51	30	39	N	− 1
α Lyra ....*Vega*	1	18	31	17	2.0	38	38	00	N	+ 3
α Aquila ....ALTAIR	1.2	19	42	38	2.9	8	26	2	N	+ 9
α Pavo....................	1.2	20	12	23	4.8	57	15	40	S	− 11
α Cygnus...........*Arided*.....	1.2	20	35	44	2.0	44	41	18	N	+ 13
α Cepheus ....*Alderaimin* .	3	21	14	35	1.4	61	52	46	N	+ 15
α Crux....................	2	21	57	40	3.8	47	45	38	S	− 17
α Pisces Australis ...FOMALHAUT.	1	22	48	24	3.3	30	30	19	S	− 19
β Pegasus ....*Scheat*	2	22	25	41	2.9	27	10	29	N	+ 19
β Pegasus ....MARCAB....	2	22	56	27	3.0	14	18	33	N	+ 19
α Andromeda ....*Alpheratz* ..	2	23	59	47	3.1	28	24	10	N	+ 20

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